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A STUDENT REVERIE

BY

FREDERICK GLEASON CORNING

E.M., LL.D.

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Mr. Frederick Gleason Corning

One West Seventy second Street

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PLATE I

FREIBERG, SAXONY (TWENTY MILES FROM DRESDEN)

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A
STUDENT REVERIE

An Album of Saxony Days

(FREIBERG NEAR DRESDEN)

BY

FREDERICK GLEASON CORNING

E.M., LL.D.

"Speak to the Earth and it shall teach thee."

NEW YORK

1920

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18163A

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TO MY WIFE
MARION ADELINE VERNON CORNING

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CONTENTS

PAGE

FREIBERG THE CITY 3

FREIBERG MINES 9

FREIBERG ROYAL MINING ACADEMY 17

FREIBERG LIFE 37

Contrasts in Outlook, Then and Now—The Careless Simplicities of Youth *vs.* The Burdensome Complexities of Maturity

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ILLUSTRATIONS

PLATE I . . . . . *Frontispiece*
Freiberg, Saxony (20 miles from Dresden)

FACING PAGE

PLATE II 4
The Cathedral (Dom) and Market Place
King John of Saxony
The Moritz Tomb in Dom
The Pulpits in Dom

PLATE III 5
Herders Ruhe
Kreuz Brunnen
Park (Freudenstein)
Donats Thurm

PLATE IV 6
Karl Theodor Körner

PLATE V 7
Freiberg Obermarkt
One of the larger Freiberg Mines

PLATE VI 8
Alexander von Humboldt (Photogravure)

PLATE VII 10
Gabriel Auguste Daubrée

PLATE VIII 11
Freiberg Smelting and Chemical Works

PLATE IX 14
Some Freiberg Ores

PLATE X 16
Royal Freiberg Mining Academy
Hotel de Saxe, Freiberg

PLATE XI 17
Abraham Gottlob Werner
Christian Leopold von Buch

Digitized by Google

ILLUSTRATIONS

FACING PAGE

PLATE XII 18
Werner's Tomb

PLATE XIII 19
Bernard von Cotta

PLATE XIV 22
Friedrich August Breithaupt
Friedrich Mohs
Carl Friedrich Naumann
Wilhelm August Lampadius

PLATE XV 23
Carl Friedrich Plattner
Julius Weisbach
Ferdinand Reich
Moritz Ferdinand Gätzschmann

PLATE XVI 24
Theodor Scheerer
Gustav Zeuner
Friedrich August Breithaupt
Bernard von Cotta

PLATE XVII 25
Twelve of the Freiberg Faculty
1. Viertel
2. Kreischer
3. Undeutsch
4. Gretschel
5. Richter
6. Winkler
7. Stelzner
8. Weisbach
9. Ledebur
10. Erhardt
11. Gottschalk
12. Leuthold

PLATE XVIII 26
Albin Weisbach
Clemens Winkler
Theodor Richter ("Rektor")

PLATE XIX 27
Alfred Stelzner
Jack Hammond
Philip J. Oettinger

PLATE XX 30
James Furman Kemp (Photogravure)

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ILLUSTRATIONS

FACING PAGE

PLATE XXI 36
Raphael Pumpelly
Gardner F. Williams
Philip J. Oettinger

PLATE XXII 37
The Werner Monument
Schweden Denkmal

PLATE XXIII 38
Raphael Pumpelly (Photogravure)

PLATE XXIV 40
Gardner F. Williams (Photogravure)

PLATE XXV 44
James Duncan Hague

PLATE XXVI 45
Louis Janin

PLATE XXVII 46
Rossiter Worthington Raymond

PLATE XXVIII 47
Samuel Franklin Emmons

PLATE XXIX 48
John Hays Hammond (Photogravure)

PLATE XXX 52
Waldemar Lindgren

PLATE XXXI 53
James Benton Grant

PLATE XXXII 54
An American Underground Threesome

PLATE XXXIII 55
An International Trio of Convivial Freibergers (White, McKee, Pratten)

PLATE XXXIV 56
A Freiberg Mine Survey Party

PLATE XXXV 57
An Underground Anglo-American Quintette

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ILLUSTRATIONS

FACING PAGE

PLATE XXXVI 58
A Yale Freiberg Trio (Cunningham, Hawley, Hammond)

PLATE XXXVII 59
Freiberg Superintendent in Parade Uniform
Franklin Guiterman
A Germanized American Freiberg Dandy (A. J. Bowie of California)
Edgar P. Rathbone

PLATE XXXVIII 60
A Real German Beauty

PLATE XXXIX 61
César Vicuña

PLATE XL 62
North and South America at Freiberg (Frederick Gleason Corning, César Vicuña)

PLATE XLI 63
A Trio of Kid Glove Miners (Stoiber, Corning, Guiterman)

PLATE XLII 65
The Three Mining Graces (Mrs. Victor Clement, Mrs. Fred Corning, Mrs. Jack Hammond)

PLATE XLIII 66
Marion Adeline Vernon Corning (Photogravure)

PLATE XLIV 68
Frederick Gleason Corning (Photogravure)

PAGE

VIGNETTE 69
Gluck-Auf

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A STUDENT REVERIE

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FREIBERG THE CITY

FREIBERG, in Saxony, and its Royal School of Mines (Königliche Sächsische Bergakademie) are historically of unusual scientific interest and importance. The city was founded in 1175. Its famous silver-lead-copper mines, collectively considered one of the greatest mining regions of Europe, were discovered in the twelfth century, while its celebrated Mining Academy was established in 1765 under government supervision and patronage.

Forty-three years ago, or say about 1875 to 1880, the period of my studies there, the city had a population of 20,000, which had grown to about 30,000 in 1895. It is situated twenty miles southwest of Dresden, in the Erzgebirge (Ore Range) on the Münzbach near its confluence with the Mulde, and is the center of general administration of the mining and metallurgical industries throughout Saxony.

The usual new-world notion of a mining town or "camp" as a hurriedly erected, incomplete if not even dilapidated, collection of improvised houses and smoking, whistling works, dotted with ugly mining dumps fringed with tin cans and other unsightly refuse—evidences of crude, unsettled living—in no sense applies to Freiberg. In every way the picture now unfolding shows a situation quite the contrary.

As the foremost mining center and an ancient impe-

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rial city, long the residence of the Saxon princes, there were bestowed upon Freiberg many important privileges. These princely rulers were the grandee electors who, in armored pomp, elected the king, and whom the artists of old were wont to borrow as picturesque models for immortalization in the masterpieces of the epoch, now so worshipful in quality and price. Perhaps, even, the figures on our playing cards originated away back here! Again, surrounded by this wealth of nature, may not these earliest blooded sports have also been the discovering coterie who showed the way to "Wein, Weib und Gesang"? As they were in fact the original kingmakers, much was expected of them by the royal demand of the day for choice revelous accompaniments!

They must have been the "real things" in kingly birds of Paradise; crafty courtiers, no doubt, but, by profession, efficiency experts in Kingology, as it were. They knew the game of Courts and Kings, and doled out to the adoring people as square a deal as their manifest gratitude and well-being appeared to warrant. And the grateful people followed gladly in their leaders' many aspirations and creations, from precious metals to rulers.

To these autocrats the modern-day confused tenets and disjointed applications of democracy would have sounded like the weird jargon of missing-link savages. But they achieved results in progressive upbuilding, nevertheless, by the most sacred forms of secret diplomacy. And the people were happy and appreciative. Are they either now? Perchance the world may yet need to close down the lid once more on "das liebe Volk," and invoke the resurrected wisdom of these shrewd nobility-philosophers who knew the king business so well in all its bearings! Moreover, these princes of power and enterprise were the ideal monopolists of old, for they owned the treasures beneath the earth, the waters on top for their silver extraction (the mints inclusive), and the air above through which came from on High the

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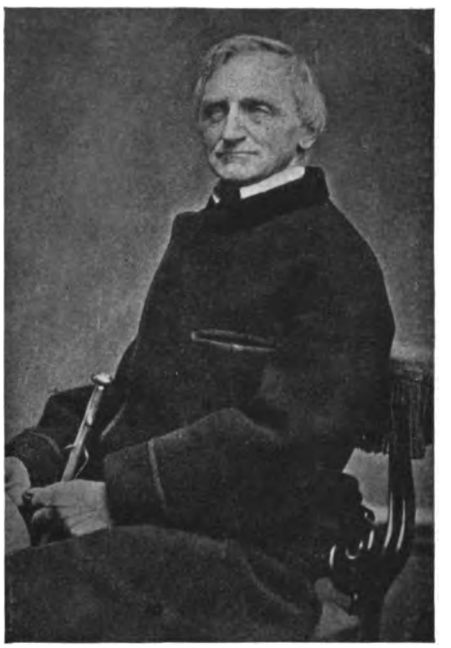
PLATE II

THE CATHEDRAL (DOM) AND MARKET PLACE



KING JOHN OF SAXONY
Reigned 1854 to 1873
Succeeded by his son Albert

THE MORITZ TOMB IN DOM

THE PULPITS IN DOM

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PLATE III

HERDERS RUHE

KREUZ BRUNNEN

PARK (FREUDENSTEIN)

DONATS THURM

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Divine Right of Kings of their own creation who hence "could do no wrong." Here was, indeed, a royal sweep of monopoly. They coveted not the kingly bothers and responsibilities, preferring rather to hold themselves the mysterious power for imperial creations, for, in return, their royal handiwork-appointees held the devoted people in the hollows of their hallowed hands, thus closing the monopolistic circle. Freiberg then was incubated in this proud atmosphere of treasure and privilege.

After "business hours," by way of diversion, the chief concern of the many petty rulers of the day over the numerous principalities of crazy-quilt contrasts, appears to have been waging alternate campaigns of trespass and defense. In the latter event, the exclusiveness of our Freiberg princes became cleverly discreet, for they elected to follow the fashionable precedent of preparation and built their own great bastioned walls. Hence in 1187 this city of royal resource and importance started its enterprise of permanent defense. And to-day long sections of the old moss-grown walls of bygone centuries still stand picturesquely amid shaded parks and encircling romantic walks.

These ancient fragmentary ruins enclose, among other things of more than passing interest, a fifteenth-century cathedral of Gothic beauty, whose "Goldene Pforte" is a richly adorned portal in Byzantine style, a surviving remnant from an older church built in the twelfth century, whose sculptures rank high in medieval art. The group is an allegorical representation of the Kingdom of God, with reliefs and statues of Old and New Testament types and scenes. Behind the altar is the impressive burial chapel of the noted Protestant princes of Saxony, adorned with sculptured monuments of rare, quaint beauty, among which is one of Prince Maurice, who fell in the battle of Sievershausen in 1553. There is also a monument to Werner (born 1750), who is interred here, one of the foremost scientists of Frei-

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berg's early days. In the adjoining Lady Chapel are the remains of Henry the Pious and his successors down to Johann Georg IV, who died in 1694.

If these German blue-blood warriors really looked the part in life, as fit and high and noble as their patron artists have here portrayed and forever preserved them in bronze, stone, and color, they were surely qualified for any beauty show on earth or in the heavens above. But it may well be doubted whether, in the highest flights of earthly class-conceit, these tough old knights, now in prayerful repose, ever dreamed themselves such pretty persons of unsullied purity.

But perhaps the oldest of all the Freiberg relics is the castle of Freudenstein in the suburbs of the city, built in 1175 as part of its system of defense. Within these grounds there was erected in 1851 a monument to Werner, the father of geology, and in 1874 a statue was placed there in commemoration of the soldiers who fell in the Franco-German War of 1870–71. In 1762 a famous battle was fought hereabouts between Prussians under Prince Henry and Austrians under General Hadik, who was defeated.

Reverence and high regard for these monumental landmarks of history were inborn among the old-world peoples—the non-utilitarian aspect being of small moment. But the average careless student had little concern for these relics of hoariest, sacred antiquity, for primarily he was not "doing" this mining citadel and its exacting course of study for other than extra-technical, material purposes. Frankly speaking, useful knowledge and worldly gain were the goal of his ambition, so Baedeker's guide-book had small place in a Freiberg library.

Passing along now nearly one hundred years, it was on September 25, 1850, that the centennial birthday of Werner was celebrated at Freiberg and the Royal Academy with great pomp and impressive enthusiasm,

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PLATE IV

KARL THEODOR KÖRNER
Freiberg, 1808
Famous Lyric Poet

Born at Dresden, September 23, 1791; died on the battle-field at Gadebusch, in Mecklenburg, August 26, 1813.

Also studied at Leipsic and Berlin. Continued his literary career in Vienna, and in 1811 was made "Poet to the Court Theatre." His complete works were published in 1834.

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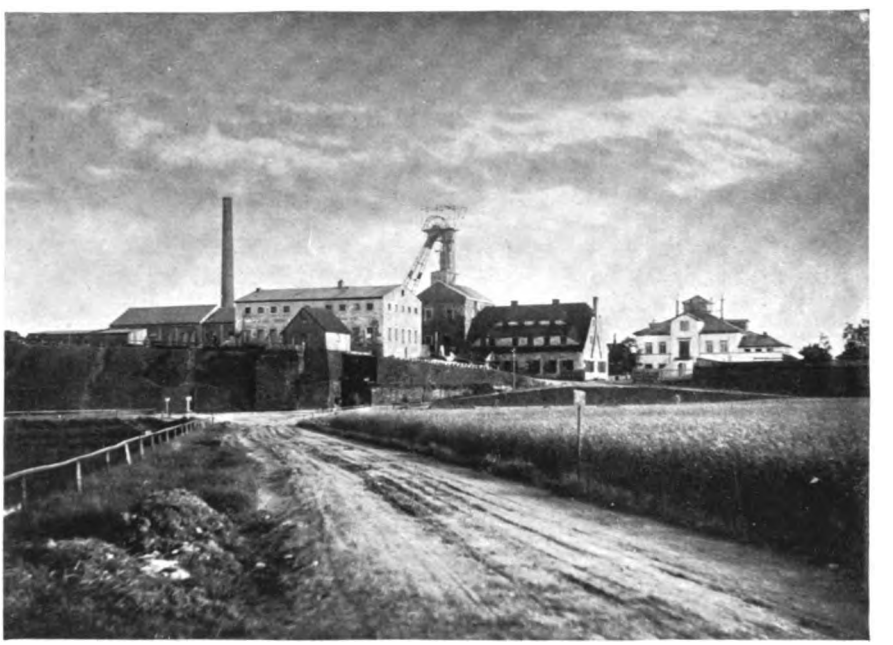
FREIBERG OBERMARKT



ONE OF THE LARGER FREIBERG MINES
(Himmelfahrt)

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an event at that time of wide interest among scientific circles throughout Europe.

Primarily, of course, Freiberg owed its eventual great rise and fame to the discovery and widely expanded operation of its mines through the centuries; but later there also flourished here extensive manufactories of gold and silver lace, woolen, linen and cotton goods, also iron, copper and brass wares, shot, gunpowder, white lead, beer, etc. Besides the various old buildings composing the Mining Academy and its laboratories, the other public edifices are the town hall of the fifteenth century, the "Gymnasium" and "Realschule," a female burgher school, new law courts, barracks, an antiquarian museum, a natural history museum, and a preparatory mining school for training mine foremen, mechanics, etc.

Here then, in Saxony, was an old-established community and a sizable city, permanent in a sense rarely found in mining, and combining associations of momentous historic and political import with industrial and academic resources quite unique and alone in their singular individuality.

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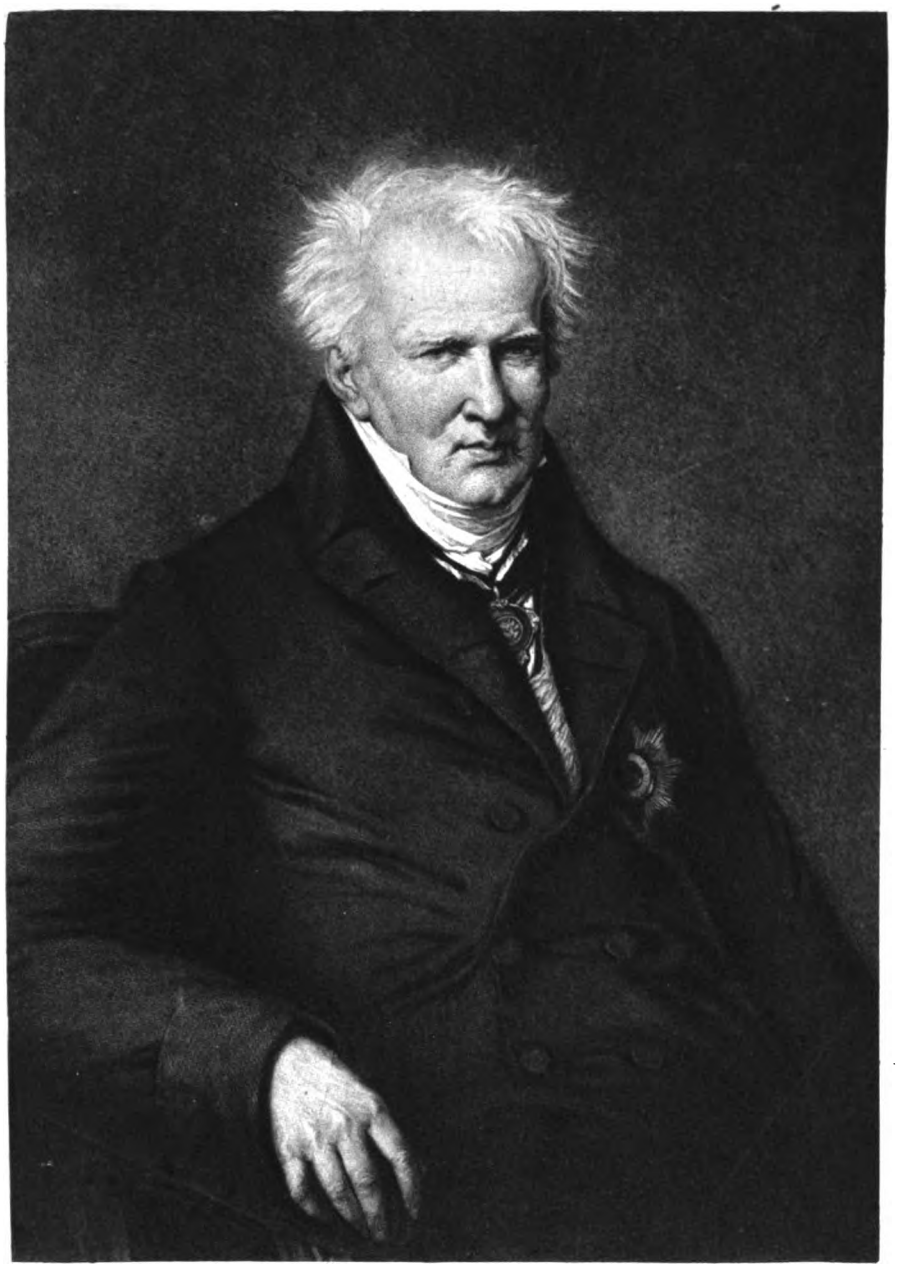

ALEXANDER VON HUMBOLDT
(BARON FRIEDRICH HEINRICH ALEXANDER VON HUMBOLDT)
BORN—BERLIN SEPT. 14, 1769; DIED—BERLIN MAY 6, 1859. MINING ENGINEER AT FREIBERG 1791

PLATE VI

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ASTOR, LENOX
TILDEN FOUNDATIONS

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FREIBERG MINES

THE celebrated Freiberg series of veins and cross-veins occur in the gneiss rocks of the "Sächsische Erzgebirge," and belong mainly to the older types of fissure lodes falling under the general class of metalliferous deposits formed relatively near the surface by ascending thermal waters in genetic connection with igneous rocks. The prevailing gray and red gneiss country rock occurs in many different structural varieties and shades, and passes over into mica schists and beds of limestone in places—the entire formation being traversed by dikes of porphyry and basalts. Among several hundred veins in the district, more than half have been worked as mines; and owing to the unusually wide extent and great variety of the veins and ores of Freiberg and its suburban districts, and because of there having been made accessible through the centuries by innumerable mine workings hundreds of miles in aggregate on the strike and dip, unequalled opportunities were afforded for the observation and study of vein phenomena such as the relations of vein filling to wall-rock, vein crossings, faulting, their behavior in depth, and the genesis of ore deposits in general. The Rothschönberger Stollen alone, the main navigable Freiberg deep adit, 10 x 10 feet, some thirty miles long and thirty-three years in building (the longest in the world), connects up the many groups of mines in the entire district, and drains their

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collective waters into the Elbe River above Meissen, which will give some idea of the immense amount of cross-cut work besides the regular drifting and sinking done in this network of vein-systems.

So it came to pass that Freiberg was visited by mining and geological aspirants and scientists from all the mineral districts and educational centers of the world —many governments sending their brightest young men there to pursue, practically, mining and metallurgy for the development of their home industries.

Among the earlier celebrities it was particularly Gätzschmann and Breithaupt of Freiberg, and Daubrée of France, who, in their investigations, made important discoveries respecting lode and country-rock metamorphosis. The former found that the impregnations of mispickel in the decomposed lode-enclosing gneiss were still going on and were caused by the internal decompositions active within the lodes themselves. Daubrée, in his "Études sur le Métamorphisme," defined these peculiar phenomena: "les dépôts métallifères ne sont que des cas particuliers de phénomènes métamorphiques." The researches of these pioneers in the science of ore deposits tended to show that most fissure ore deposits, not essentially consisting of hydrated peroxide of iron, were formed not on the surface of the earth, but at considerable depths below, and, through transformation, have taken on their present appearance and character; and that accordingly, and because of the participation of water in the origin and transformation, the formations should be properly designated as hydroplutonic.

These vein-systems of complex and diverse types and ages have been studied and scientifically described by modern as well as by the older geologists and scientists of renown. Others of the recognized local authorities of the past who became widely known through their studies and learned brochures on Freiberg were: A. G.

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PLATE VII

GABRIEL AUGUSTE DAUBRÉE

Born at Metz June 25, 1814; died at Paris, France, May 30, 1896
Honorary Member American Institute of Mining Engineers

Brilliant Frenchman, and famous geologist of the day. One of the notable authorities and writers on Freiberg. Made many contributions to geology, mineralogy, and hydrology. Studied at the École Polytechnique, Paris, and at the École des Mines, Paris; graduated as Mining Engineer.

Traveled in Great Britain, Germany, Algiers. In 1838, Mining Official in the Department of the Upper Rhine and also Professor of Geology in the Academy of Strasburg. In 1861, chair of geology in the Musée des Sciences Naturelles at Paris. Later Professor of Geology in the École des Mines, and, in 1867, Inspector General of Mines. In 1872 Director of the École des Mines for fourteen years. In 1879 author of Études Synthétiques de Géologie Expérimentale, followed by publication in 1887 of three large volumes:

One volume on: "Les Eaux Souterraines aux Époques anciennes. Rôle qui leur revient dans l'origine et les modifications de la substance de l'écorce terrestre."

Two volumes on: "Les Eaux Souterraines, à l'Époque Actuelle, leur régime, leur température, leur composition, au point de vue du rôle qui leur revient dans l'économie de l'écorce terrestre."

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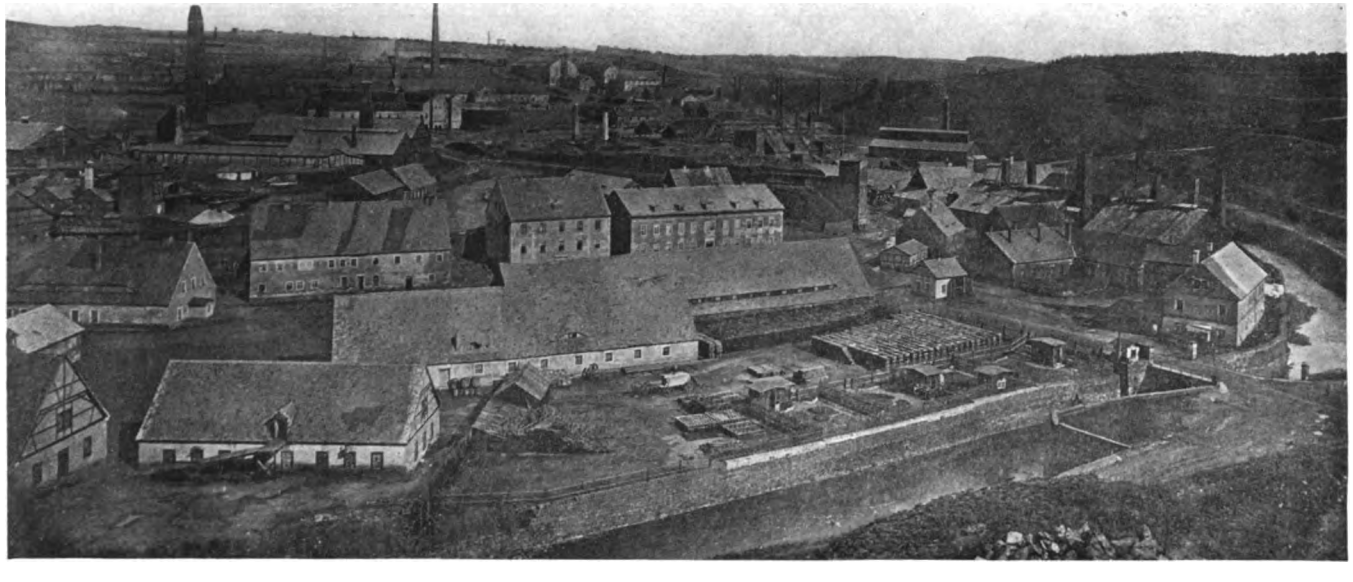
PLATE VIII



FREIBERG SMELTING AND CHEMICAL WORKS
(Muldner Schmelz Hütten)

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Werner (1791), A. von Weissenbach (1836), J. C. Freisleben (1843), F. C. von Beust (1840), Bernard von Cotta (1861), and H. Müller (1849–1900).

The older veins were usually grouped by these writers under four heads or vein-types, as follows:

(*a*) Noble Quartz Formation ("Edle Quarz Formation"): meaning high-grade or rich silver ores; fine quartz, argentite, native silver, pyrargyrite, pyrites, arsenopyrite, etc.

(*b*) Pyritic Lead Formation ("Kiesige Bleiformation"): quartz, galena, pyrite, zincblende, arsenopyrite, chalcopyrite.

(*c*) Noble Lead Formation ("Edle Bleiformation"): quartz, rhodochrosite, ankerite, galena, pyrite, zinc, tetrahedrite, pyrargyrite, polybasite, and proustite.

(*d*) Tin Formation: cassiterite, chalcopyrite, quartz, arsenopyrite, fluorite, etc.

The younger veins were classed as the Barytic Lead Formation ("Barytische Bleiformation"): galena (low in silver), chalcopyrite, tetrahedrite and blende, quartz, calcite. They were usually found to run relatively strong and of considerable width, frequently carrying nickel and cobalt minerals as well. Authorities of the day assigned them to the Tertiary age, and probably connected with the basaltic eruptions of that geological period.

The older group are by some authorities considered to be genetically related to the intrusions of granitic rocks of the Carboniferous age—more specially defined as lodes formed relatively near the surface, the metallic ingredients being carried upward in eruptive rocks now largely eroded. Their economical value, however, has been proven by profitable operations to depths of from 1500 to over 2000 feet, with ore continually still normal, it is claimed (?).

The "Edle Quarz Formation" was found to be intersected by dikes of quartz porphyry, but little, if any, typical granite appears in the Freiberg mines proper, though granitic structural developments of the gneiss are quite common. The ore bodies or "shoots" are rather irregular in these veins, collectively considered,

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but some of the more extensive bodies of specially high grade and large tonnage frequently occur along the zones of vein-intersections. The rocks which appear to favor the deposit of ores in the traversing fissures, sometimes termed the "ore carriers," cannot be designated absolutely, their influence being only relative and local. But in quite a general way, without regard to the particular formation, the lodes of economical importance may be said to live and yield better in compact rocks in which quartz, feldspar, or hornblende, as well as carbon (graphite) or carbonate of lime, form essential ingredients; while on the other hand, within less compact or shattered micaceous or magnesian rocks, the ore deposition has shown unfavorable development. Sharp and significant distinctions are made between the typical Freiberg gray gneiss and the red gneiss, although there are many intermediate grades and transition zones between the two varieties which cannot be properly assigned to one or the other. The normal gray gneiss, however, appears in the Erzgebirge more decidedly to favor the metalliferous contents of the veins than the red gneiss, which latter carries few veins, as a matter of fact. Moreover, where the red variety (containing the red feldspar) does occur well defined, it appears intrusively as an igneous rock even carrying occasional enclosed fragments of the gray, or again it actually courses as a defined dike of gneissic-granitic structure.

The distinctions between the normal Freiberg gray gneiss and the red have been chemically and microscopically analyzed as follows:

FREIBERG GNEISS

Normal Gray Gneiss	*Red Gneiss*
Silica 64–67%.	Silica 74–76%.
Ingredients: orthoclase, some oligoclase, quartz, and much dark mica.	Ingredients: orthoclase, quartz, and small amount of light mica.

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In the Pyritic-Galena-Quartz Veins of the Freiberg "Kiesige Bleiformation" that have been mined to depths of over two thousand feet, the galena contains one tenth to two tenths per cent. of silver, but the pyrites, zinc-blende, and arsenopyrite run poor in silver.

Although the ores, as a whole, in these numerous vein-systems are complex, the method of treatment at the mines was comparatively simple, consisting of crushing and mechanical ore dressing or concentration at or near the main shafts and surface plants of the various groups of properties, and shipment of the products to government smelters centrally located. Labor being very cheap, the ore was hand-assorted into many shipping classes, according to metal contents and suitableness for the smelting processes. The poorer grades remaining were crushed, classified, treated on jigs, percussion and revolving tables, and other washing apparatus of the primitive old-school types. Mechanical concentration, one of the basic branches of economic mining, owes its development, in great measure, to the Freiberg masters—the names, works, and achievements of such men as Rittinger and Gätzschmann being standard among the old-world constructive authorities in the ore-dressing art of that early formative period. In later years, of course, the entire plant and practice became greatly revolutionized and improved through United States leadership, so that much of the older apparatus and hand labor manipulations no longer have place in the present state of the art.

In the production of the shipping ore classes, by hand sorting to a high degree of metal contents, and making the corresponding concentrates by the ore-dressing process, the aim was not only one of enrichment by discarding the waste rock, but also to create products for the smelters best suited in point of mineral and metallic constituency and combinations for their various processes. Some of the principal classes of ship-

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ping products (ores and concentrates) were those in which (*a*) lead and silver predominated; (*b*) silver predominating; (*c*) copper; (*d*) zinc; (*e*) arsenic; (*f*) pyrites, etc., etc. In general the gold contents were small, only certain ores of the richer variety carrying appreciable amounts.

Illustrative of the economical character and stoping yield of Freiberg lodes, taken over a long period of time, the records show that for one hundred years (1765 to 1865) the delivery or market value of the ore per running square yard of vein was in round figures $15, an average of the rich and poor ore shoots and the good and bad years and varying widths of ore bodies taken together. Furthermore, considering that the statistical summaries show the total delivery or selling value of the mines' outputs for these same hundred years to have been $52,500,000, or at the rate of $525,000 yearly, an idea may be had of the relatively restricted scale and attendant business results of the Freiberg operations. There were, of course, prosperous periods of bonanza-years with much larger yield than this average figure. While the profit margin and rate of returns in this old industry, employing thousands of men, hardly measured up to the modern speculative standards of the new-world get-rich-quick mining undertakings, yet the old-fashioned business policy and slow operating pace, it must be admitted, had the merits of extraordinary thoroughness, conservatism, and patience, and the maintenance of the exploration and development work far afield assured wide extent of the ore ground in reserve for rainy days.

Two extensive government smelting, refining, and chemical works treated the many and often complicated ores and ore products from the Freiberg fields, and those of other home districts and foreign markets as well, namely: Kgl. Muldner Hütte and Kgl. Halsbrückner Hütte.

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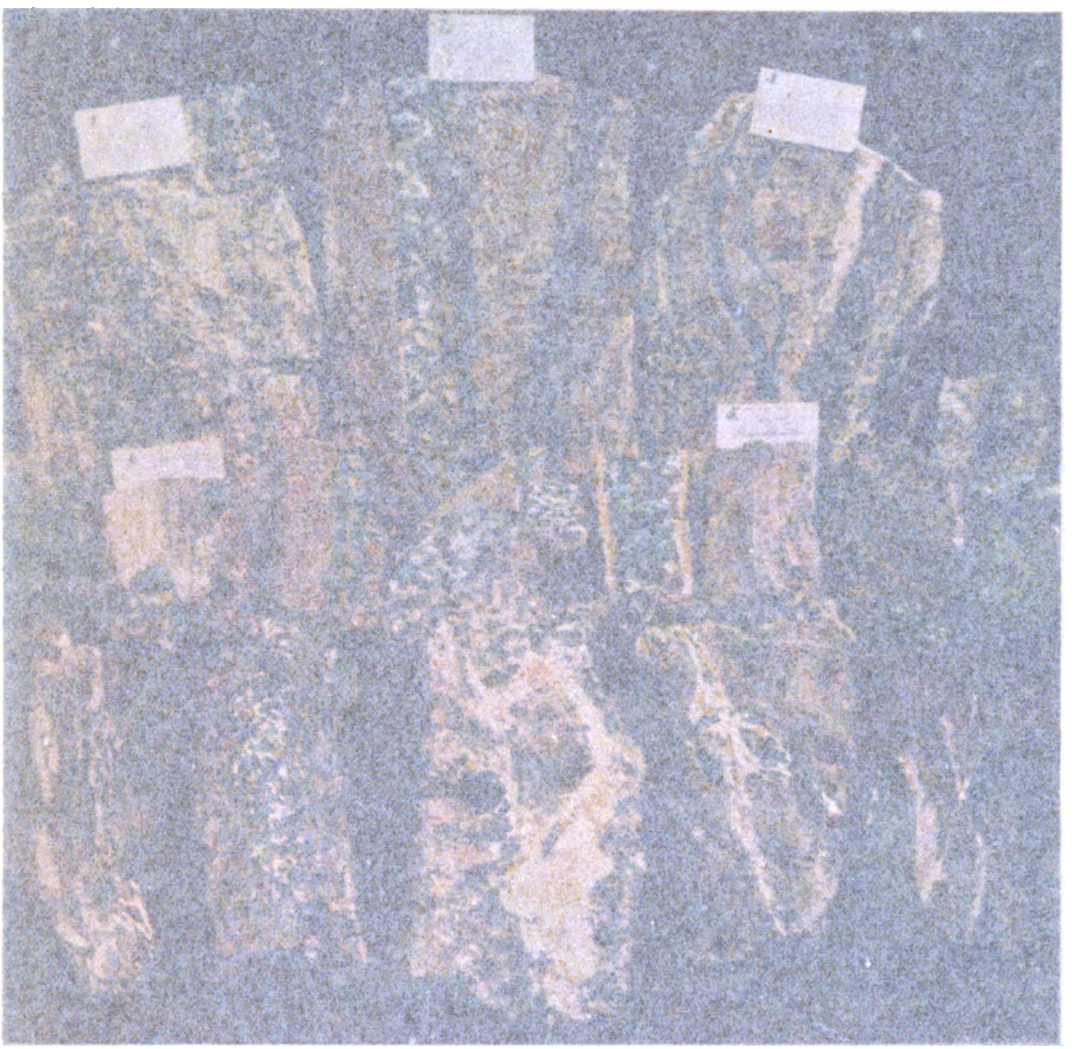

Galena. Zaccibenae. Iron and Copper Pyrites. Kaolin.

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PLATE IX

SOME FREIBERG ORES

Galena. Zincblende. Iron and Copper Pyrites. Baryta. Gneiss.

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These plants and their diversified processes became, in their way, as widely known as the Freiberg mines themselves. The furnaces, refineries, chemical and accessory buildings, situated but short distances from the city proper, cover many acres widely distributed in their respective valleys. Some of the larger mines as well as these central smelting plants and many other works in Saxony are government-owned.

While in the early days silver constituted the chief realizable value of the district's output, from 1845 on the proportionate value of other metals and of the miscellaneous by-products rose rapidly, as evidenced by these figures, compiled at wide intervals:

PROPORTIONATE VALUES

Year	Silver	Lead	Copper	Miscellaneous Products
1845	92%	7%	1%	.....
1875	64%	15½%	6%	14½%
1902	50%	14½%	6%	29½%

It is of scientific interest that, in addition to the foregoing principal products, there were produced at times quite a number of the very rare elements, among which were indium and germanium (discovered by Freiberg savants), also selenium, tellurium, thallium, platinum, palladium, and iridium. Indeed, the Freiberg works outranked all others of the day in their great variety of finished smelting and chemical products.

After long record years of profitable activity on an expanding scale, the Freiberg mining and metallurgical industries declined to a point of prostration, largely through the disastrous fall and long-continued depression in the silver market and, at times, in the prices of other metals as well. For example, in recalling the prevailing average prices per ounce for only twelve years of this low period—

1897—60.48¢; 1898—59.01¢; 1899—60.15¢;
1900—62.00¢; 1901—59.59¢; 1902—52.79¢;
1903—54.25¢; 1904—57.87¢; 1905—61.02¢;
1906—67.68¢; 1907—66.15¢; 1908—53.49¢;

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—it will be realized what a strain was put upon these old industries, not counting the increase in cost of mining with depth and wide extent of underground workings, cost of material, rates of wages, etc., and why the government was so often obliged to come to their assistance. Whether these ancient mines will ever be profitably resurrected, now that high prices for silver again prevail, remains to be seen.

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PLATE X

ROYAL FREIBERG MINING ACADEMY
Interior Court of Principal Building

HOTEL DE SAXE, FREIBERG
Where the Americans met

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PLATE XI

ABRAHAM GOTTLOB WERNER

Born at Wehrau, Upper Lusatia, September 25, 1750; died at Dresden, June 30, 1817.

The Founder of Scientific Geology. Enrolled at Freiberg 1769.

In his day the foremost scientist in Mineralogy and Geology. His works and lectures, for many years as Professor at the Royal School of Mines of Freiberg, brought the Institution and German science into greatest prominence and attracted students from all over Europe.

CHRISTIAN LEOPOLD VON BUCH

Freiberg, 1790

Born at Stolpe, Prussia, April 26, 1774; died at Berlin, March 4, 1853.

One of Germany's most celebrated geologists and traveled scientists. Among his works were "Geognostische Beobachtungen auf Reisen durch Deutschland und Italien," "Physikalische Beschreibung der Canarischen Insein," "Reise durch Norwegen und Lappland."

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FREIBERG ROYAL MINING ACADEMY

N such an extraordinary mining atmosphere as had early developed at Freiberg, amid unique opportunities for the pursuit of scientific studies hand in hand with geological excursions and actual practice in the mines and smelters, covering the basic and collateral branches of diversified metal mining—all situated in great expanding fields of ever new discoveries, enriching through the years the accumulated data of experience—no wonder that German inborn love of systematic learning and efficiency should have demanded here, in 1765, the establishment of the Freiberg Mining Academy, "die älteste technische Hochschule der ganzen Erde" (the oldest technical "High College" in the world); and, indeed, as it transpired, this state institution within range of the culture of Dresden, and the Kingdom of Saxony behind it, was not only the parent of all schools of mines, but for very many years of its acknowledged leadership was also the model for all similar colleges of later date.

As a matter of historical interest, the men who, as presidents ("Rektor") and professors, have directed the destinies of this truly Royal School of Mines from its birth down to recent times, are here recorded in chronological order, many of them having been, in fact, graduated from Freiberg: Generalbergkommissar Frhr. von

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Heynitz (later Royal Prussian Minister) and Berghauptmann von Oppel to 1769; Berghauptmann Pabst von Ohain and Oberberghauptmann von Ponickau to 1784; Berghauptmann B. von Heynitz to 1801; Oberberghauptmann von Trebra to 1819; Oberberghauptmann Frhr. von Herder to 1838; Berghauptmann Freisleben to 1842; Oberberghauptmann von Beust to 1869; Gustav Zeuner to 1875; Theodor Richter to 1896; Clemens Winkler to 1899; Adolf Ledebur to 1901; Erwin Papperitz to 1903; Geheimer Bergrath Prof. Adolf Ledebur, 1904; . . . Geheimer Bergrath E. Treptow, 1910; . . . Oberbergrath Johannes Galli, 1915.

Some of the more prominent professors from the beginning down to the present time, many of whom became of world renown, are: Chr. E. Gellert (Metallurgical Chemistry), 1766–1795; J. Fr. W. von Charpentier (Mathematics, Mechanical Drawing, Mechanics), 1766–1784; A. G. Werner (Abraham Gottlob Werner), (Mineralogy, Geology), 1775–1817; J. Fr. Lempe (Mathematics, Mechanics, Machinery), 1783–1801; W. A. Lampadius (Chemistry, Metallurgy, Chemical Technology), 1794–1842; A. Breithaupt (Mineralogy, Crystallography), 1813–1866; Fr. Mohs (Mineralogy, Crystallography), 1818–1826; C. Fr. Naumann (Mineralogy, Crystallography, Physics), 1826–1842; F. Reich (Chemistry, Physics), 1827–1860; C. M. Kersten (Chemistry), 1829–1847; Julius L. Weisbach (Mathematics, Descriptive Geometry, Crystallography, Physics, Mechanics, Machinery, Mine Surveying), 1833–1871; M. F. Gätzschmann (Mining), 1835–1871; C. Fr. Plattner (Blow-Pipe Analysis, Chemistry, Metallurgy), 1842–1858; C. B. von Cotta (Geology, Paleontology, Ore Deposits), 1842–1874; Fr. W. Fritzsche (Assaying, Metallurgy), 1843–1873; C. J. A. Th. Scheerer (Chemistry, Metallurgy), 1848–1873; H. Th. Richter (Metallurgy, Blow-Pipe Analysis), 1856–1896; Albin J. Weisbach (Mineralogy), 1860–1901; A. W. Stelzner (Geology, Paleontology,

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WERNER'S TOMB
In the Freiberg Cathedral (Dom).
Born, 1750; died, 1817

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BERNARD VON COTTA

Born at Zillbach, October 24, 1808; died at Freiberg, September 14, 1879; enrolled at Freiberg 1827.

Succeeded Naumann at the Royal Mining Academy from 1842–1874 as Professor of Geology, Paleontology, and Ore Deposits. He conducted many geological surveys for the Government, and was a prolific contributor to the scientific literature of the day. His "Treatise on Ore Deposits," translated into English, 1869–1870, by Frederick Prime, Jr., an American Freiberg Mining Engineer, was the authoritative basic work of the early period. His publications also included "Geognostische Wanderungen," "Geologie der Gegenwart," "Der Altai," etc. After Werner, von Cotta was Freiberg's most widely known geologist and author.

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and Genesis of Ore Deposits), 1866–1870 and 1874–1896; G. G. Kreischer (Mining), 1871–1891; G. Zeuner (Mechanics, Machinery), 1872–1875; H. Gretschel (Mathematics), 1873–1892; Cl. A. Winkler (Chemistry and Chemical Technology), 1875–1902; A. Schertel (Metallurgy), 1896–1902; and some of the faculty of 1915: E. Treptow (Mining, Ore Dressing, Briquetting); E. Papperitz (Higher Mathematics, Descriptive Geometry, etc.); Leoben R. Beck (Geology, Ore Deposits, Paleontology); O. Birkner (Political Economy, Finance, Insurance, Mining and Smelting Statistics); C. Schiffner (Metallurgy, Electro-Metallurgy, Assaying); P. Wilski (Mine Surveying and Geodesy); G. Brion (Electrotechnic, Physics).

The academic library has over fifty thousand volumes and brochures. The mineral collections, of which there are four, viz.: A. G. Werner's (12,000), Professors Breithaupt and Weisbach's (40,000), and two smaller ones, have in the aggregate about sixty thousand specimens. The geological collections cover five classes of specimens: 1st, General Geology and Petrography; 2d, Paleontology (animal); 3d, Paleontology (plants); 4th, Sections of Ore Deposits; 5th, for microscopic examinations of rocks, etc. There are also at hand collections of models in the departments of Mechanics, Mining, and Ore Dressing, Machinery, Metallurgy, Chemical Technology, Iron Metallurgy, Mechanico-Metallurgical Technology, etc. Also chemical, assaying, blow-pipe and metallurgical laboratories; collections of mining and land-surveying instruments, building materials, plans, etc. All of the surveying practice is carried on in the underground workings and around surface plants at the various mines and works.

There were in my day (1875–1879), and still are, four principal courses, three to four years long, and for which final examinations were required for those applying for diplomas and degrees—though this was

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optional with the students—they could elect thus to specialize or take a mixed course, the latter plan being usually adopted by the Americans who came for special subjects and courses rather than for the regular curriculum planned for the German students.

The four standard courses were for: Mining Engineer, Metallurgical Engineer, Mine Surveyor, Iron Mine Engineer and Metallurgist.

A still higher degree, namely, "Doktor-Ingenieur" (in the nature of an honorary title), may be obtained by a holder of any one of the above degrees, by his post-graduate submission of an acceptable dissertation, and otherwise conforming to certain "Promotion Rules" of the Dresden Technical High College in coöperation with the Freiberg Mining Academy governing this particular bestowal.

We Americans usually combined the main subjects of Mining Engineering and Metallurgy, which, of course, embraced Mine Surveying, Assaying, etc. Those going in for the Mining Engineer degree would also attend many of the lectures for the Metallurgical course, and conversely those going in for the Metallurgical Engineer degree would also attend the Mining Engineering lectures, etc. A list of the subjects usually taken in my day by those aiming to combine the Mining and Metallurgical courses, appears on the official academic papers as follows, thirty-two in number: Advanced Mathematics, Descriptive Geometry, Selected Chapters of Higher Mathematics, Higher Equations, Natural Philosophy, Mechanics, Machinery, Machinery Drawing (First and Second Parts), Inorganic Chemistry, Organic Chemistry, Qualitative Chemical Analyses, Quantitative Chemical Analyses, Mineralogy, Practical Determinations of Minerals, Crystallographic Determinations, Geognosy, Science of Ore Deposits, Paleontology, Petrography Determinations, Mining (First and Second Parts), General

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Metallurgy, Assaying (Lectures and Practice), Blow-Pipe Analyses (Determination), Geodesy and Mine Surveying, Underground Surveys and Map Making, Geodetic Practice, Experimental Physics (Lectures), Experimental Physics (Laboratory Work), Building Construction, Mechanical Drawing and Planning of Mining and Metallurgical Plants, Mining Law, General Jurisprudence.

But the foregoing list does not comprise all of the subjects lectured upon at Freiberg, with their corresponding practical courses. True to the traditions of German efficiency there were still more on tap!

The Mining Engineer's examination and degree, however, covered proven qualifications in fourteen subjects, besides a thesis on a given problem or project in practical engineering, chosen by the faculty, and for the submission of which five to six months were allowed.

These fourteen subjects, taken from a diploma awarding the degree of Mining Engineer ("Berg-Ingenieur"), dated December 1, 1879, are recorded as follows: Higher Mathematics, Descriptive Geometry, Mechanics, Experimental Physics, Mineralogy, Geology, Paleontology, Mining Law, Jurisprudence, Mining, Concentration (Ore Dressing), Ore Deposits, Mine Surveying, Mining Machinery.

The very comprehensive curricula at Freiberg, even in my day, over forty years ago, also facilitated the pursuit of specialties quite apart from the regular engineering courses. Thus, students and older graduates of other colleges desirous of specializing in geology and mineralogy, could follow a dozen different lectures and "praktikums" in constituent branches of this group. Similarly, in chemistry and chemical technology, many lectures covering this special field were available to fill out a two or three years' course, etc. Hence the Academy's rank and standing of scholarship, in my day and since, has always been on a par with the highest institu-

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tions of learning, such as the leading universities and polytechnics.

In the American colleges and universities forty-five years ago there were, of course, able lectures being given on many mining subjects, and various more or less complete Mining and Metallurgical courses had been gotten well under way at established schools of mines; but they had not at that time become rounded out or risen to the high standard they subsequently attained. At this writing, however, and indeed for many years past, American schools of mines such as Columbia, Massachusetts Institute of Technology, Yale, Harvard, the universities of California, Lehigh, Pittsburgh, and Golden (Colorado), etc., have also taken their places in the front rank of mining colleges, and are far better adapted for present-day American requirements and practice. But because of American institutions having caught up to, and in some respects surpassed, Europe in facilities and standards for our purposes, thus making it no longer necessary or even desirable to pursue one's entire course of mining engineering study abroad, this does not in the least detract from Freiberg's prominence and unequaled contribution, in early days, to mines and mining.

Weighing fairly, therefore, the greatly perfected educational advantages of our own technical institutions of learning during, say, the last thirty-five years, and their present high level of scholarship, Europe may nowadays be regarded solely as inviting for finishing purposes and post-graduate specializations; while, of course, the acquirement of one or two foreign languages (preferably Spanish and French) is always a live asset for the wider practice of the expert mining engineer and manager. Generally speaking, it seems self-evident that the quality and quantity of a professional education, especially mining engineering, should bear close

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PLATE XIV

FRIEDRICH AUGUST BREITHAUPT

FRIEDRICH MOHS

CARL FRIEDRICH NAUMANN

WILHELM AUGUST LAMPADIUS

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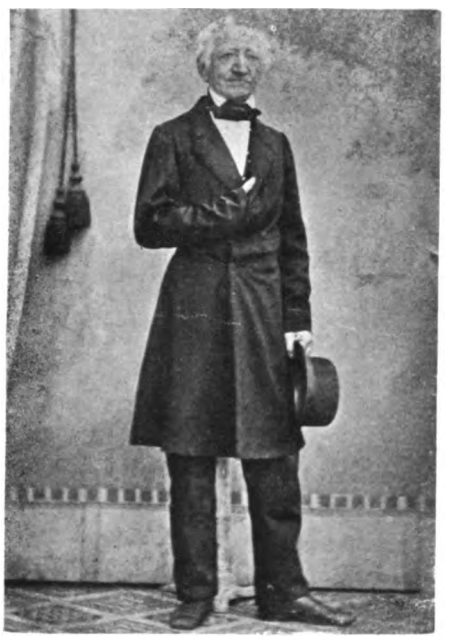
PLATE XV

CARL FRIEDRICH PLATTNER

JULIUS WEISBACH



FERDINAND REICH

MORITZ FERDINAND GÄTZSCHMANN

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relation to the necessities and "ways of doing things" of the country in which one expects to live and function —fitting in, as it were, with the home conditions and standards, industrially, economically, and even politically.

Among the other important European schools of mines of the years in question, the École des Mines of Paris, the London Royal School of Mines, and the Bergakademie at Clausthal, situated among the mines in the Hartz Mountains (in coöperation with the Berlin-Bergakademie), were the leaders; but the schools at Liège, St. Étienne, Przibram, Leoben (Austria), Fahlun (Sweden), St. Petersburg, and Chemnitz were also favorably regarded.

Looking backward, again, Freiberg had, besides the attraction of antiquity, certain natural advantages of location difficult to duplicate, as well as the wide fame of its savants and their literature, standard of that period, which lent a prestige to the Academy, historically and scientifically, beyond that of any other institution. Indeed, from this old citadel there emanated an amazing volume of epoch-making scientific and technical literature on mining, metallurgy, the genesis of ore deposits, geological surveys, mechanical processes of ore treatment, and the related arts, much of which was translated into other languages and issued as authoritative in its day to the remotest parts of the earth.

At the risk of possible repetition, a list is here submitted of some of the more prominent German scientists who studied at Freiberg, a sample lot of the foundation men of olden days who were leaders in the life of the Academy—in the highest sense epoch-makers in their respective lines, whose labors and publications have placed the profession of mining, and indeed the scientific culture of the world, under lasting indebtedness:

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Name	Year	Student's Academic No.
Joh. Friedr. Wm. Charpentier	1766	4
Abraham Gottlob Werner (the "father of geology")	1769	52
Leopold von Buch (in 1853 "Kammerherr" in Berlin)	1790	345
Frhr. von Humboldt (Alexander)	1791	357
Carl Friedrich Mohs	1798	503
Karl Theodor Körner (the famous poet)	1808	697
Fr. Aug. Breithaupt	1811	747
Carl Friedrich Naumann	1816	829
Ferdinand Reich	1816	832
Carl Fr. Plattner	1817	835
Karl Gustav Adalbert von Weissenbach	1819	904
Mor. Ferd. Gätzschmann	1821	953
Julius Ludw. Weisbach	1822	981
Karl Moritz Kersten	1822	992
Carl Bernard von Cotta	1827	1148
Frhr. von Herder (Eugene Wolfgang)	1827	1149
Carl Johann August Theodor Scheerer	1830	1243
Carl Gottl. Gottschalk	1842	1524
Hieronymus Theodor Richter	1843	1530
Albin Jul. Weisbach	1850	1727
Alfred Stelzner	1859	2115
Paul von Groth (Munich's greatest mineralogist)	1862	2295

These creative men of Freiberg, for the gift of their learning, will ever merit high place in the Science Hall of Fame.

Numerically, Freiberg has never been a large affair—a qualitative rather than a quantitative institution. In fact, for a long time, it seemed as though there were nearly as many officials, "Ordentliche Professoren," "Ausserordentliche Professoren," "Dozenten," and "Assistenten," as students. This feature, however, had its decided advantages in that it facilitated personal contact and close informal association with members of the faculty, contrasted with the more official aloofness and exclusiveness of the larger universities. Up to 1838 inclusive, only 1416 men of all nationalities had matriculated, nineteen having entered in that year; and the records show that for one hundred and thirty-seven years (up to 1903), in all 4823 students had entered. Gradually, however, the number increased from about

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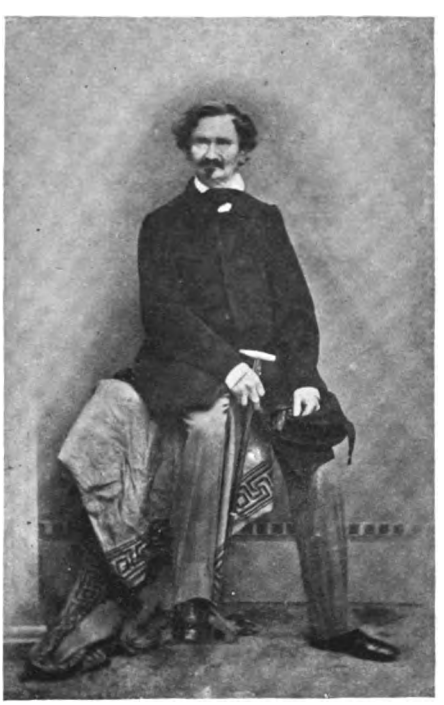
PLATE XVI

THEODOR SCHEERER

GUSTAV ZEUNER

FRIEDRICH AUGUST BREITHAUPT
Enrolled at Freiberg 1811



BERNARD von COTTA
Freiberg, 1877

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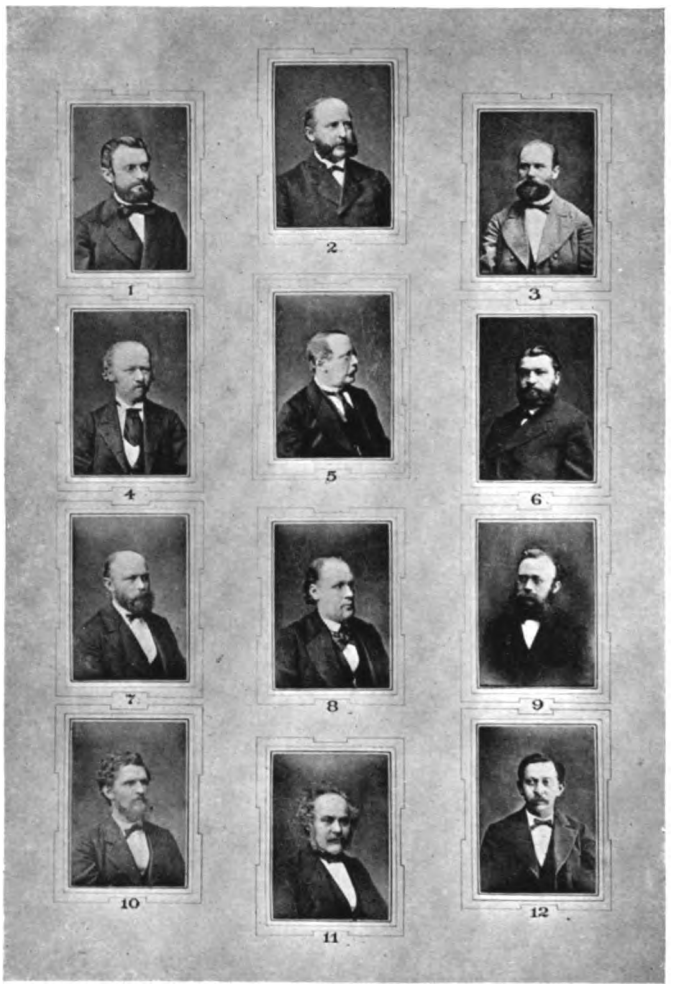
PLATE XVII



TWELVE OF THE FREIBERG FACULTY
1875–1880

1 Viertel	2 Kreischer	3 Undeutsch
4 Gretschel	5 Richter	6 Winkler
7 Stelzner	8 Weisbach	9 Ledebur
10 Erhardt	11 Gottschalk	12 Leuthold

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150 in my day to over 470 in 1902, of which one half were foreigners. The student body continued to grow, but later dropped off, until in the war year 1914–15, the number had declined to 247, one third being foreigners. The American attendance had already been falling off for many years, for the obvious reasons noted above.

As early as 1838 an occasional American appeared on the academic register; but it was not until 1854 that our students began to come from the United States in increasing numbers. The Academy was always exceedingly liberal and accommodating in its policy of encouragement toward the Americans, facilitating in every way their gaining admission to the lectures; and for that matter this was the official attitude toward all foreigners, because, like the Americans, the others, too, played an important rôle in the affairs of the Academy and in the entire community, socially and otherwise. Then, again, the limitations and difficulties under which foreigners labored from inadequate knowledge of German, made for leniency and helpful toleration on the part of the directorate.

Our fellows were usually accepted by virtue of their degree-diplomas or other graduation credentials, certifying to the successful completion of undergraduate courses. Quite a number had already pursued mining or other engineering studies at home and visited Freiberg more for finishing purposes and to "have a look around," while attending lectures on a few specialties. Indeed, in the full and oftentimes embarrassing realization that much would be expected "at home" of the returned Freiberger, it was quite a problem to know just what line of studies to follow to the best advantage. There were so many of the distinguished faculty to meet, with an even more bewildering menu of subjects and lectures to select from (handicapped frequently by limited knowledge of the language), that to make wise choice of a study-program for a given length of course

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was no easy task. The scheme was (or should have been) to maximize the cardinal, useful branches, and minimize the least necessary subjects, those unlikely to be called for in practical professional life, and to fit the selected curriculum into the allotted time, whether one, two, three, or four years, with or without final degree-examinations, as the case might be.

For those advanced students not well up in German nor planning to take the regular long and somewhat tedious top-heavy course for the conferment of the degree, the opportunities were excellent for absorbing, with comparative ease, a rather wide and varied useful knowledge of mining subjects, because of the numerous "praktikums" that made up fully half of the course, in the laboratories and collections of the chemical, physical, machinery, blow-pipe, assaying, petrological, paleontological, microscopical, drawing and geodetic departments, not to mention the underground surveys and work in the mines, concentrators, and smelters, and trips of inspection during the vacation times. The conversational character of these exercises afforded, of course, the best opportunities rapidly to improve one's speaking knowledge of German; but really to follow the lectures profitably, a fair familiarity with the language was quite indispensable.

There were twelve principal professors in the faculty of 1875–80: Viertel (1), Kreischer (2), Undeutsch (3), Gretschel (4), Richter (5), Winkler (6), Stelzner (7), Weisbach (8), Ledebur (9), Erhardt (10), Gottschalk (11), Leuthold (12), who were among the eminent men of Germany in their respective branches.

Their official duties seemed to include an unwritten ethical obligation to cultivate and entertain the students socially, as well as elevate them academically, which intimate relations would have been impossible to maintain in a larger institution with scholars running into the thousands. Outside of the lecture room, at society

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Albin Weisbach.

CLEMENS WINKLER

THEODOR RICHTER—"REKTOR"

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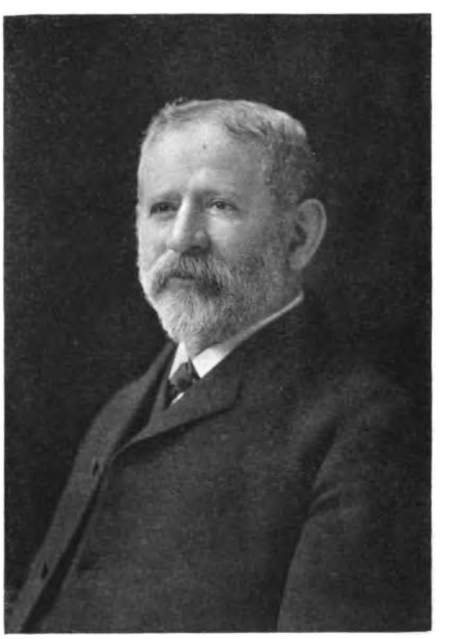
PLATE XIX

ALFRED STELZNER
Professor of Geology, Freiberg, 1877

JACK HAMMOND AT FREIBERG
1876–1879



PHILIP J. OETTINGER
New York, 1920
(Freiberg, 1865)

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functions, concerts and the like, they would relax and fraternize with the students, on equal terms, recalling the careless happy hours of their own youthful university days. They opened their homes hospitably, especially to the foreigners, giving series of dinners spread over the winter and summer semesters, to which the students were invited in groups of ten to fifteen at a time; and the expense of all this wining and dining made no small inroads upon their meager salaries.

In similar relations of camaraderie, professors and students met at the concerts, balls, and beer gardens; and also on the geological and mining excursions, surveys and inspections, when a veritable picnic fraternity prevailed. In the dark hours of the morning, the students in mine clothes would start in parties for the mines for a day underground, while at other times we went down on the night shift. Arriving at the shaft just in time for the change of shifts and while the usual service of prayer by candle-light with organ and weird congregational singing was in progress, we were assigned by the manager or superintendent to a foreman, who acted as guide for the surveying or other purposes of the trip.

The miners of all ranks and stations were obliging, simple people, proud of the reputation of the Academy, and desirous of accommodating the foreign visitors and students. They were keenly interested in hearing tales about the mining districts in distant lands and the home cities of the foreigners, which filled them with much wonderment. These plain miners were essentially a religious set. One of the more fervent men once remarked at the daily service that the contrast must appear striking to the Americans, whose miners always "started below with a curse on their lips," as he had been informed. ("Immer fahren sie ein mit einem Fluch!")

Four of the faculty, Stelzner, Richter, Weisbach, and Winkler, were, perhaps, the most widely known, and at

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the same time enjoyed greatest popularity among the students. They spoke several languages, and Stelzner and Richter knew more English than many foreigners' knowledge of the German language. They were practical, progressive men of vision, and, temperamentally, quite up-to-date in their clubby tastes and ideas.

Alfred Stelzner (Freiberg, 1859) lectured on all of the geological subjects. He had been the favorite scholar of Bernard von Cotta years before, and was called to the Academy to succeed him. In the interim, Stelzner had been Professor of Geology and Mineralogy at the University of Cordoba, and had conducted geological surveys in the service of the Argentine Government, his reports on the geology and paleontology of that republic being accepted as authoritative in geological literature. He was a highly accomplished and traveled scientist, speaking, besides German and English, French, Spanish, and Portuguese. Having returned to Freiberg from roaming far afield in the outside world of expansion and movement, he infused into his lectures and delivery a certain snappy, enlightened style of presentation, derived from his contact with the new-world currents of progress, all of which lent to his instruction the charm of original appeal.

The practice hours devoted to rock, fossil, and ore determinations under the magnetic, energetic Stelzner were regarded by the students as the most agreeable and profitable of the entire course. The inherent attraction of his branches and their practical utility created a large following and regular attendance at his lectures.

There was much about this brilliant and highly cultivated geologist, intellectually, temperamentally, and even in general physical appearance, that suggested his younger friend, Professor James Furman Kemp (now long identified with Columbia University, N. Y.), the widely known and gifted American geologist, a scientist of highest accomplishments, most genial character, and

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personal charm, all his own. Though not an enrolled student at Freiberg, Dr. Kemp has visited in this field and participated in some of the geological excursions with members of the faculty. In fact, to this day, he is one of the best authorities on all matters personal and educational pertaining to the old historic district and the Royal Academy. As one of America's most popular and sympathetic authors and teachers, Kemp has passed on to his many classes of eager students the lore of ore deposits, which is so largely derived from the old masters of the Freiberg institution.

Of all scientific subjects and scientists, geology and geologists are probably the least narrow and prosily materialistic. In the pursuit of geological studies, *par excellence,* there comes into play a mysterious inspirational power derived from closest association with Nature's huge creations and forces. Set with sublimest scenery, in a supernatural atmosphere of beauty and with the marvelous unfolding of Nature's ways, the awakening consciousness of the eternal powers, the majesty of conception, the everlastingness of time, material, force, and movement, and of resulting life itself, create an intimate approach along the paths of science, to the very gateway of the unfathomable secrets and mysteries of life. These awe-inspiring, magnetic influences and the dawning comprehension of universal greatness, transmitted through these poetic and scientifically romantic contacts, cultivate the reverential uplift and expanding vision. They strike through and through with spirituality and bring to the surface in fullest refinement the finer traits and aspirations of character. These are the transcendent situations and flights, which mellow and broaden the faculties, making for man at his best, and creating the fiber of the very soul of life.

Dr. Theodor Richter (Freiberg, 1843) was the "Rektor" of the Royal Academy, and signed the official

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papers, certificates of attendance at lectures, diplomas, degrees, etc. He was widely known in Europe for his lectures on metallurgy, assaying and blow-pipe analysis, and as the discoverer of indium. In appearance he was of the spectacled German type, though more trim and better-looking than the average. The many "praktikums" connected with his branches afforded ample opportunity to get well acquainted with the Rektor, who coöperated with his assistants in this analytical work. He was a democratic man in a quiet way and of a serious turn of mind not so readily relaxable. Among his distinguished private students was Thomas Egleston of New York, later a founder of the Columbia School of Mines. Egleston, however, studied chiefly in Paris and did not enter regularly at Freiberg.

Albin Weisbach (Freiberg, 1850), scholar of Breithaupt (Freiberg, 1811), enjoyed as mineralogist and crystallographer much prestige as the successor of Breithaupt, and especially as the son of the original and famous Julius Weisbach (Freiberg, 1822), who wrote the great work on Mechanics and Machinery, among others, translated into English by our distinguished American Mining Engineer Eckley B. Cox (Freiberg, 1862).

In Weisbach's lectures on mineralogy and the difficult, dry, and unpopular crystallography, he had a peculiar unmagnetic delivery. As a corps student he had received a severe long saber-gash across his broad forehead which was thought to have influenced his sight and facial expression, suggesting, at times, even mental eccentricity. There was a great deal of dry formulæ connected with his courses; and as the very nature of these subjects precluded the wide inspirational sweep and scientific uplift inherent in the geological group, the popularity of his teaching was not on a par with Stelzner's.

Clemens Winkler had made a great name for himself

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JAMES FURMAN KEMP, A. B., E. M., D. Sc., LL. D.
(ANOTHER AUTHORITY ON FREIBERG AND FREIBERGERS)

ADELPHI ACADEMY, BROOKLYN, 1865-1877; AMHERST 1877-1881; COLUMBIA SCHOOL OF MINES 1881-1884, ASSISTANT TO DR. NEWBERRY THERE; LEIPZIG AND MUNICH UNIVERSITIES LATER; PROFESSOR OF GEOLOGY AND PUBLICIST OF DISTINCTION AT THE SCHOOL OF MINES, COLUMBIA UNIVERSITY, NEW YORK; AUTHOR OF "ORE DEPOSITS OF THE UNITED STATES AND CANADA" 1893—"HAND BOOK OF ROCKS" 1895.

—INVALUABLE FRIEND AND COUNSELOR OF THE RISING ENGINEER—

PLATE XX

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ASTOR, LENOX
TILDEN FOUNDATIONS

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in all branches of chemistry, and his lectures on chemical technology were especially fine and instructive. His courses were sought by students specializing in these branches, quite apart from the pursuit of mining or metallurgical engineering. Winkler was a brilliant man of much originality and also possessed the happy faculty of coming down to earth among the boys, and through personal magnetism and good will winning their confidence and ambitious endeavor.

A bureau for the sale of specimens, appropriately mounted and carefully labeled, conducted under Herr Wappler, was an active department of the Academy, which encouraged the students making mineral collections, and incidentally served as an informal meeting-place for social exchanges. Selected type-specimens of ores and the associated minerals, in crystal forms as well, characteristic of the various vein formations, were to be had as low as a few cents apiece—special prices made to students only. For the small sum of twenty-five dollars a useful collection could be put together representing the metallic and non-metallic minerals most commonly met with in practical mining, and to serve also as the foundation for a larger collection to be gradually accumulated through later years.

If called upon to criticize the old Freiberg educational system—no agreeable or easy task in view of its prominence and acknowledged excellence—the following general comment may be permitted: It seemed to us Americans, inexperienced as we were in those far-back times, that in some of the lectures on mining methods, machinery, and processes of treatment, much valuable time and energy were needlessly wasted in wearisome historical recitals, in greatest detail, of the formative and development stages of these arts, past and forever gone and of no present practical moment.

It lies in the German character to doctrinize and academicize (words created for Teuton glory!) their sub-

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jects and teaching, from the most rudimentary foundations upward, at the expense of the larger vital things—so by the time the really useful realities and worth-while essentials are reached, a brain-fag may have set in, crippling the mind for further receptive effort. The national book-making, encyclopedic habit of mind with love for minute classification, and the mental reflex of the involved language, all blended, peradventure, with soporific surcharges of excellent beer, may partially account for a certain ponderosity of viewpoint and the theoretic bent of the Germanic race!

The book-worm feature of the instruction at the Academy was, however, in great measure, offset by the ample opportunities referred to for practical observation and work in the mines, ore-dressing and smelting works, without which Freiberg's advantages and efficiencies would have been very much reduced.

For some years, beginning about 1850, it became a sort of fashionable educational fad to go to Freiberg for a mining career, whether there was to be any studying done after arrival there or not. And while the bare fact of having entered as a student or even visited the place did frequently lend a certain glamour to Freibergers, this accorded hall-mark of efficiency, of course, did not in any sense furnish a magic guarantee of real mining capacity, training, and judgment. But the sojourn at Freiberg, in any event, did stand for a man having had a chance, of the best and wisest choosing *at the time,* to acquire useful first-hand knowledge to put him well along on the road to a successful career, provided he in turn could supplement the situation by furnishing some natural capacity and personal character to do his individual part. Of course, the powers of the Academy to perform outright miracles without the student's serious application, were no nearer millennial perfection than those of any other college. Indeed, after all is said and done, it seems evident that the best of educations may

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have its tragic limitations and grave disappointments in practical application to the demands of life's problems, oftentimes bitter, harsh, and heartless. So, in the last analysis, to forestall regrets, it is perhaps just as well to inventory the choice preliminary intellectual capital of professions as the mere A B C that contribute to spell a possible eventual success, and which alone can be crystallized into triumph by talent, intuition, keenness, and initiative. These elemental qualities, perhaps the component potentialities of the much accentuated "common sense," go far in the race for successful endeavor. They can ill afford to be spared, while their fortunate possession may fully compensate for poor college achievements, if not, indeed, the entire sacrifice of a college course, if need be. Hence our college and university training, be it what it may, needs at all times the cultivation of these natural faculties and the ripening, balancing observation and absorbing experience of life and the world in action.

But on the whole, and quite impartially, be it said, Americans have acquitted themselves with credit and have also contributed in very large measure to Freiberg's fame, as did their eminent teachers before them. This is fully evidenced when, in reviewing the history of the sweeping technical and industrial advances in scientific mining which characterized the years succeeding the period in point, the American Freibergers are found to have migrated to the remotest mineral sections —the mining missionaries, as it were, on the world's frontiers of advancing industry—and there left in home and foreign fields their marks of achievement in the upbuilding of these foremost of basic industries ranging from iron to gold, and from coal to diamonds.

Just how much of their success is accreditable to Freiberg training, how much to their previous education, and the share properly assignable to their practical experience in post-graduate years, we may not know until

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PLATE XXI

RAPHAEL PUMPELLY AT FREIBERG, 1856. Nineteen years of age

GARDNER F. WILLIAMS AT FREIBERG, 1865

PHILIP J. OETTINGER AT FREIBERG, 1865

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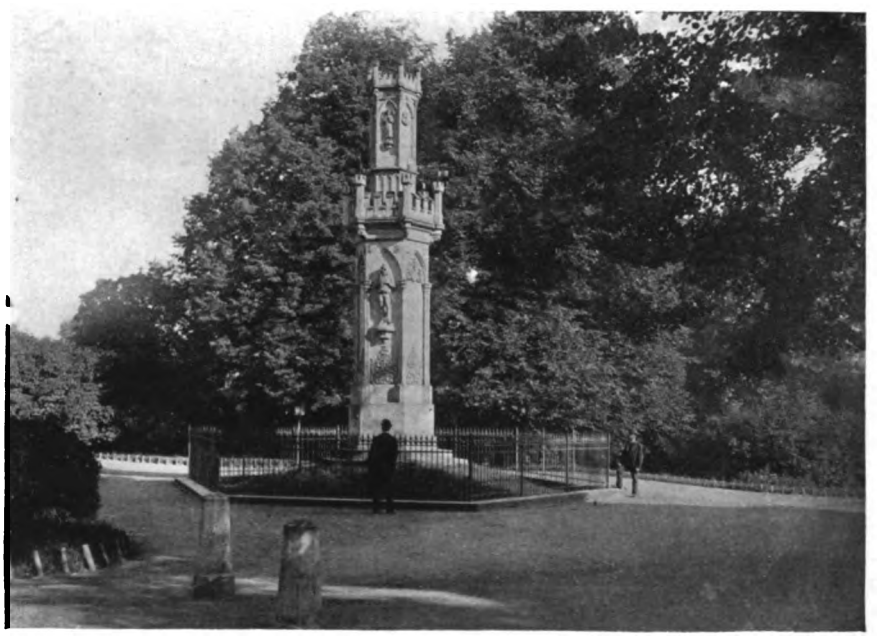
PLATE XXII

THE WERNER MONUMENT
FREIBERG, SAXONY



SCHWEDEN DENKMAL

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FREIBERG LIFE

CONTRASTS IN OUTLOOK, THEN AND NOW—THE CARELESS SIMPLICITIES OF YOUTH *VS.* THE BURDENSOME COMPLEXITIES OF MATURITY

BUT Freiberg was not all mines and miners in a setting of history and science, an environment rich with the lore of antiquity; for, even in the cold bleak winters, banked with snow and ice, the old moldy burg created through its student life a unique social atmosphere all its own—of tone and color quite distinctive in rugged charms, while to the scholastic life there was much of good-fellowship, culture, and romance. Strange and curious intricacies of structure were here compounded, suggestive of the varied phenomena of the ore and geological formations themselves, if a prosaic simile be permitted.

Here were gathered together, from all parts of the globe, men of all ages, hues, customs, and civilizations, presenting an international ensemble of striking, engaging contrasts—for the greater part young men of importance and accomplishments. Many languages, suggesting the biblical Babel, were heard on the streets, in the cafés, and in the corridors of the Academy; and although students from France were rare, the French language, next to German and English, was most commonly heard, spoken by the Russians, Poles, Italians,

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Spaniards, and South Americans who found common social and linguistic ground along French lines of boulevard *causerie*. So, after all, in popular parlance, there was "some class" to little Freiberg, quaint and overrun with its picturesquely garbed miners and students.

True to the university town customs of the empire, the Germans had their regular corps duel performances and meeting-places, and exchanged with the brother organizations of Dresden, Leipzig, and other student cities. Some few Americans joined these "Verbindungen," and frequently excelled in the "Schläger" contests, establishing championship records and names of terror for themselves in the German student world. In contrast with these there were several social quasi-scientific societies, notably "Vorwärts" and "Glück-Auf," made up of Germans not usually joining the corps. At their periodic gatherings, for "Bier Abend Gemüthlichkeit," the reading of mind-improving papers and other mild forms of entertainment filled up the evenings with quiet conservative respectability. These people were regarded as "solide junge Leute"; but the real swagger set of dandy imitation knights gravitated toward the corps life of beer, buttons, ribbons, and other trappings of youthful, bumptious German heroics—shall we say the miniature swash-bucklers and forerunners of the tainted types that were eventually to initiate Germany's fall from grace!

The average American boy seems not to measure up to the German student in his beer-drinking inclination or capacity. There is lacking in him the "Altdeutscher" internal beer-brewery drainage and stomachic tank capacity nonchalantly to imbibe swinish quantities of the national beverage. Nevertheless, in competitive endeavor to be accommodating, our boys on occasions managed to hold their own, measured by the "Bier Gesetze" (the students' beer code of reciprocal drinking).

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RAPHAEL PUMPELLY
(83 YEARS OLD)
STUDIED AT FREIBERG 1856-1859

EMINENT GEOLOGIST-AUTHOR-SCIENTIST AND MINING ENGINEER. FORMERLY PROFESSOR OF ECONOMIC GEOLOGY AT HARVARD. EARLY TRAVELED IN CORSICA. CONDUCTED EXCAVATIONS OF EARLIEST PREHISTORIC CIVILIZATIONS OF CENTRAL ASIA, UNDER GRANTS FROM CARNEGIE INSTITUTION. IMPORTANT PROFESSIONAL AND GOVERNMENTAL ENGAGEMENTS IN ARIZONA, CALIFORNIA, NORTHERN MICHIGAN, WISCONSIN, JAPAN, CHINA, ETC. ETC.

—OUR AMERICAN VON HUMBOLDT—

PLATE XXIII

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ASTOR, LENOX
TILDEN FOUNDATIONS

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But in a city of Freiberg's size and resources, there had to be, of course, some "real society"; and indeed, the inherited rural provincialism of the place had in more modern days taken on quite a palatable flavor of cosmopolitan trend in things social. So it was that "ganz raffinirte Gesellschaft" had come into its own full blossom, composed of the families of professors, mining and state officials, military officers and other high-ups, if any, who, with the students, were the bright particular sustaining lights. There were two of these exclusive sets, or "Tanz Vereine," with no little club particularity to gain admission, and they encircled Freiberg's élite and set the standards of "der gute Ton." The Americans, as always, privileged beings, were very welcome members, and it was some social splurge to belong to both sets of these inner circles at one time.

The Americans, even those on moderate allowances, when their dollars were once exchanged into four times as many marks, were considered in affluent circumstances and of certain worth-while consequence and merit, including, of course, potential marriage possibilities, which latter, however, rarely were realized. "Verliebt" and "Verlobt" in upper circles were terms of grave import in susceptible Germany of old. No repudiation liberties of the "scrap of paper" variety about these treaties of the heart were tolerated in polite society. So declaratory trifling along these delicate lines was best avoided unless prepared to go through with the program.

But our boys were entitled to credit for more than mere material social assets, for it was evident that their well-bred, free and easy, at-home air and carriage met with the indulgent favor of the women folks, whatever the men may have thought of some of our original social innovations of natural spontaneity and aggressiveness in running a party. A certain self-confident, matter-of-course bearing and composed tone, and a naïve bubbling

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frankness and politeness of the heart, rather than the mere mechanical and formal drawing-room conventionalities, carried our boys into marked favor. And though they may have caused a ripple of doubtful surprise at times, on the whole we won out in our liberalizing effect on the natives. Moreover, those were the good old days when, if necessary, men were given the benefit of the doubt, for the male portion of creation was then, consequentially, an admitted nine tenths of the entire organic world.

The wholesome daughters of the quality people, some few of the ennobled families, were all there in their festive flounces and garlands. Many were comfortably nice-looking and most appreciative of manner. The era of the beauty-parlor habit, now dominating all classes, had not then dawned; the practice of first aid to beauty with ever-present lip sticks, rouge pots, powder puffs, chamois, and pocket mirrors, in the presence of a waiting, expectant world, being still a dormant art thereabouts. So there was no mask of tints and make-ups to keep a candidate for favors guessing; and lips, if accessible at all, could be reached without mining through superficial strata of chemical radiance. Provincial simplicity reigned supreme; and if color were in evidence, it was pretty sure not to come off, to mutual consternation. Better still, it might even increase through blushes of modesty and unsophisticatedness—a natural maidenly accomplishment of the good old ancestral school now well on the wane, but then flourishing at its height. Accordingly, things as seen more nearly approached realities, rendering expert knowledge of boudoir mysteries unnecessary; for even an amateur could, on sight, gauge the worst or the best in facial fitness, without fear of error or eventual disillusionment. But in other respects, the physical expositional opportunities for sound judgment were not so good in these olden days of propriety and charm-con-

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GARDNER F. WILLIAMS, M. A., E. M. LL. D. (1910)
DOCTOR OF ENGINEERING (1917)
(NOW OF SAN FRANCISCO, CAL. AND WASHINGTON, D. C.)

STUDIED AT FREIBERG 1865-1868. WAS THERE ACCORDED THE HIGH HONOR OF BEING STANDARD BEARER OF THE ROYAL MINING ACADEMY AT ITS ONE HUNDREDTH ANNIVERSARY—AN OCCASION CELEBRATED AND ATTENDED BY MANY OF THE LEARNED MEN OF EUROPE.

AUTHOR AND MINING EXPERT OF WORLD-WIDE DISTINCTION. OLDEST LIVING ALUMNUS OF THE UNIVERSITY OF CALIFORNIA. MANAGER DEBEERS DIAMOND MINES, SOUTH AFRICA, MAY, 1887, TO DECEMBER 31, 1905, ETC., ETC. A WORLD AUTHORITY ON DIAMOND MINING. AUTHOR OF "DIAMOND MINES OF SOUTH AFRICA," 1905, AN EPOCH WORK IN TWO VOLUMES, PROFUSELY ILLUSTRATED.

PLATE XXIV

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ASTOR LENOX
TILDEN FOUNDATIONS

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cealments; for the then fashion standards were demure and of the long-dress type, the daylight exploitation of form, feet, ankles, and all the rest of feminine blessedness not having been properly sanctioned or in a broad sense artistically and alluringly presented.

In other words, modern-day styles and the yachty carriage were not in evidence here, nor, indeed, was any other particular style well carried out, for that matter. These simple, real folk cared for none of these things. And what of it, after all, since the homely, homey standards prevailed so generally? With a little imagination, at our ages, it was, in these somewhat primitive circumstances, no strain of faith to bear witness to the warrant for the old Saxon rhyme:

"In Sachsen wo die schönen Mädchen wachsen."

Comparatively speaking, the ancient and honorable order of falling in love with faces first, is fast becoming to be "feet first," as proclaimed by feminine edict in the alluring abbreviated modes of to-day—their capricious object being, perhaps, to change the luck and accelerate the social, bohemian activities of the race!

Indeed, there may be profound revolutions underlying these seemingly trifling, girlish foibles, little dreamed of by the fair molders and trustees of our propriety standards and habits, which would prove startling awakeners to them did not the beneficent provisions of Nature eliminate the jar and friction of her fundamental changes by a slowness of movement that renders their advent and progress almost imperceptible, if not even agreeably tolerable.

Engulfed in the inexorable, merciless cycles of evolution with their threatening tragic, organic reversions, it would appear that man, lured by the modern feminine pace, may already have passed "over the top" in his attainment to the full dignity of the erect posture; and that he is now once more dropping back, slowly

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but surely, toward the "all-fours" locomotion! For, compelled in part by woman's fascinating, beckoning decree of abbreviated apparel—say in the current of the Sunday processionals along the modern Avenue—and partly by male gallantry, perpetually to adopt the downward, sheepish gaze in scanning the ground to which has now been transferred the inspirational, celestial zone of enchantment, there is quite naturally developed among the pious, admiring male following, the chronic, slouchy gait and earthward, reverential droop of figure and faculties. Never before, in truth, has the plain surface of Mother Earth become so favored and hallowed by the travel of her daughters in such bewildering physiological varieties and fantastic displays of the new thrilling and shapely criterions of ladylike electrics in modish yet limited draping and transparencies.

Amid this intricate profusion of ambitious limbs, each pair seemingly endowed with its own particular mission and aspiration, surely the very worms of the earth must be willing martyrs to their gentle tread, or yearn for the human uplift of faculties that shall enable them also to take notice of the passing fray.

The struggle of the classes, however, to keep in fashion with the present types of our high civilization, and go the limit, if not one better, is often pathetic, especially for those who are driven to the poorest imitations of tawdry quality and design, and who, through inadequate nourishment and income, can adequately fill neither the stockings nor the bill.

To mining scientists of deep penetration, and speculatively inclined racial students, this dominating sociological and physical trend of the times, foretelling return to the types of bygone ages, is a biological disclosure of extremest interest. In the dim, remote future of geological time, straining the mind to comprehend, the strange learned creatures corresponding

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to the present leaders of scientific thought and investigation, in roaming over the rearranged surface formations in eager quest of fossil remains of our period, will highly prize the graceful genus "limbus americana" ("limbus" meaning the fringe of hell!). And the new inhabitants will marvel at these piquant remains of a vanished race of presumably greatest talent, beauty, and highest order of achievement. Not unlikely even some of the rarer specimens of lesser symmetry will also find place in their paleontological collections, and be classified as belonging to the extremely valuable missing-link group of the Age of the American Limb.

Nevertheless, in justice to the profession of professions, let no passing frivolous comments lead to the supposition that our scientists are so unemotional and lacking in temperament as to fail in appreciation and pride for our American beauty and *chic,* however eccentric at times, and for the wide democratic distribution of these captivating national assets throughout the length and breadth of the land. On the contrary, science regards these well-turned picturesque human movies as incentives to increased pulsation,—indeed, the very mainsprings and vitalizers of life itself, that entertain, dazzle, and awaken the male portion of the community to new movement and greater endeavor. Having, therefore, registered their "say so," true to the didactic habit of mind, and thus modestly "draped with science" the terminal exhibits of tender humanity, against inclement weather and the vulgar gaze, the well-balanced savants and even the older ones bent on the solution of perpetual motion, yield to the pleasing and appetizing depravities of the simple life. Optimistically they take their places in the up-to-date procession, with all its strains and risks, there lingering in hopeful expectancy that the powers may graciously allot them, too, their shares in the distribution of favors.

Of one thing in the old days we may be sure: any

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angular or overfed, clumsy defects in lines, form, or movement, discernible to the eye of the cruel critic, in the docile Saxon Gretchens of confiding sweet simplicity, softened and vanished in the kindly dissolving moonlight of a Freiberg evening, when, blending with the shadowy landscape in perfect harmony of setting with the time, place, and occasion, the inquiring mind of "Herr Amerikaner" was at last in unruffled peace. But be it also remembered here and now that "der Herr Student" was of such high and mighty importance and privilege in this community of inherited uplift and learning, that he ran a close second to the princely electors of old, in that, like the king himself, the student, too, could "do no wrong," in the exaggerated estimation of his adorable and adoring companion.

Be this as it may, the Freiberg girls in general were nice understudies for the time being, and commendably wide awake to the chances for gaining glimpses of the outside world through cultivating the often traveled and highly accomplished students. Many had picked up an excellent parlor fluency in English and French, and also showed awakening tendencies to welcome the dawn of the liberal, progressive age that was destined to gain the emancipation of femininity and establish once and for all their leadership and superiority. Doubtless the grandchildren of these sensible, solid, affable young ladies have, at this writing, evoluted on and upward to full qualification for the most drastic reforms and nursery-diverting responsibilities of this modern cult.

There was much correct, old-fashioned form and stiffness about the society gatherings, which culminated in the usual feasting and wine drinking, the latter regarded as more "*elegant*" than beer on extra-social occasions of this sort. And while it cannot be denied that a tone of good-will and sincere jovial affability pervaded these periodic parties, it must be admitted that

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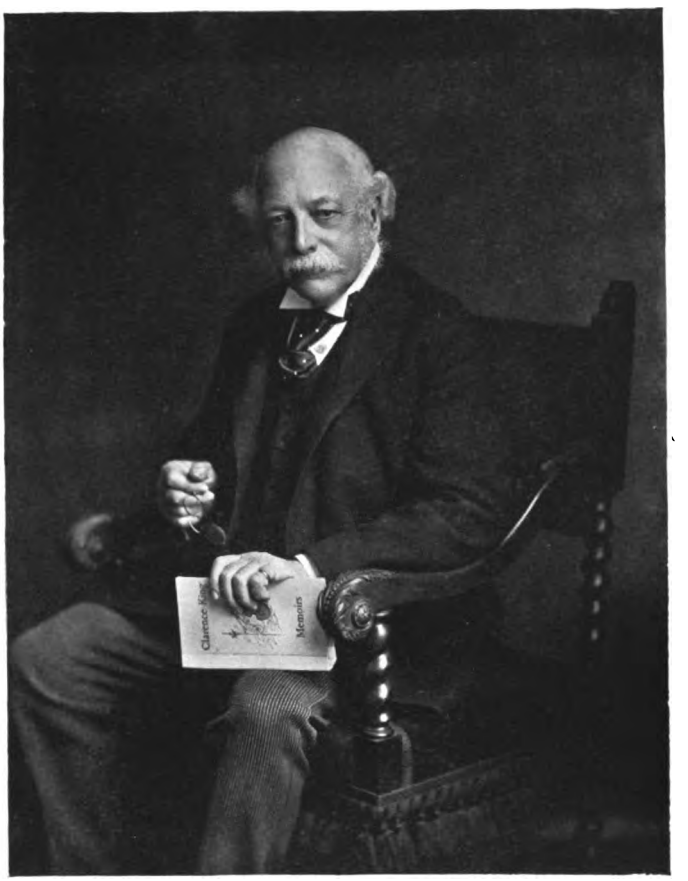
PLATE XXV



JAMES DUNCAN HAGUE
Freiberg, 1856–1858

Born at Boston, February 24, 1836; died at Stockbridge, Mass., August 3, 1908.

A Mining Engineer, highly esteemed in United States and European circles; of winning yet dignified and forceful personality.

His early studies were at the Lawrence Scientific School of Harvard University, 1854; in 1855 and 1856 at the University of Göttingen, Hanover, where among his fellow-students were the late J. Pierpont Morgan, the New York banker, and Professor Charles F. Chandler of Columbia University. Hague was early identified with copper operations in the Lake Superior region. In 1867 he became engaged in government geological and mining work with Clarence King in the famous exploration of the Fortieth Parallel. In 1878 a U. S. Commissioner at the Paris International Exposition. In 1904 edited the memorial of Clarence King. For many years, until his death, he was President of the North Star Mines Co., a New York enterprise owning the famous North Star mine of Grass Valley, California, one of the pronounced gold-mine successes of America. This property had been earlier resuscitated and developed into an important producer by John Hays Hammond. Hague made valuable professional contributions to mining literature and belonged to many scientific societies and social clubs. He was a man of quality and distinction.

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PLATE XXVI

LOUIS JANIN
Freiberg, 1857–1860

Born at New Orleans, La., 1836; died at Santa Barbara, Cal., March 6, 1914.

A leader in mining engineering and metallurgy on the Pacific slope. One of three brothers (Louis, Henry, and Alexis, all Freibergers) who became well-known engineers. Louis Janin studied at Yale in 1856, and after three years at Freiberg attended, in 1861, the Paris École des Mines. He made important contributions to the metallurgy of the Comstock and other Pacific districts, and made extended tours in Mexico and Japan. He was an attractive, brilliant man of much social charm.

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an undertone of pathetic dead earnestness possessed the atmosphere and people—while the scene was not improved by the home-made frocks and bad-fitting clothes. The rapid hopping dances with one-way pivotal wind-ups, making for eventual vertigo, were the correct thing, and to witness an American try on some reverse steps was regarded with admiring awe as a "Kunststück" of the highest order. Had some of the latter-day gliding, dipping, and shimmy steps been sprung then and there on this rural, unsuspecting community, the revolution in Germany would surely have passed into history in the long ago.

Within Freiberg's approved social circle there were many differentiations of rank and standing, designated by a bewildering assortment of mining, industrial, academic, government-official and court titles, ranging in relative importance up and down like a chromatic scale in music. Some of these marvelous compounds, unpronounceable for the new-comer, are here written down in all respect and appreciation, for they usually stood for hard brain labor, merit, fidelity, and long service to state and calling. Add, if you please, "Herr" before each, and then strain your German to the utmost, when you, too, may become awe-stricken with their complex, almost autobiographic meaning: Herr Berg-Ingenieur, Ehren - Doctor - Ingenieur, Bergrath, Oberbergrath, Geheimer Bergrath, Geheimer Rath, Geheimer Regierungsrath, Ministerialrath, Finanzrath, Kammerrath, Geheimer Fizanzrath, Berggeschworner, Polizeirath, Bergamtsassessor, Gerichtsamtsassessor, Hüttenmeister, Oberhüttenmeister, Bergbaudirector, Bergfactor, Markscheider, Stadtkrankenhausarzt, Realgymnasialoberlehrer, Oberberghauptmann, etc., etc., *ad infinitum!* In this maze of grandiose titular honor labels, a language-wrestler, embarrassed as to choice of address, could take a chance shot if he could only think to end his selection with "Rath," when his social navi-

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gation would be pretty sure to proceed unblemished and with comparative safety.

It is manifestly evident that this network of fine distinctions, besides adding to the difficulties and labor of social pleasures, made for exaggerated politeness and a certain worshipful deference. But on the other hand, there was much frank, hearty hospitality and many courtesies of the old school about these meritorious folk; and they were deserving, to say the least, of all the flattering comfort extractable from these long prefixtures. It must be kept in mind, too, that as a regulative force, the high-sounding pompous words performed their practical mission of magic, overawing effect and potential managerial powers over the common people. With learning so cheap and salaries so small, and honors great and plenty, what was more natural than to pay up differences by bestowal of titles in lieu of advancing salaries, since these simple men of high ideals and purpose, easily imposed upon as true modest merit is wont to be, were more than satisfied with emoluments of office chiefly payable in honorable recognitions and promotions? Among the people at large, their life standards were something after this order: beer and music came first; then honors and hero-worship; last of all, salary. Well may we of this rapid age of rampant, wealth-getting materialism look up to this simple, genuine community of academic idealists, of earnest standards and untarnished aspirations. The German citizen of those days, when Germany was at her best, was relatively unspoiled, simple-minded, well-intentioned, and of good heart; but for his contented social equilibrium, no matter what his rank, he must be able to boss and be the envy of some one lower down, for which in turn he was quite willing to do his servile, toady part of scraping and cringing to, and taking orders from, the fellow higher up. Great veneration

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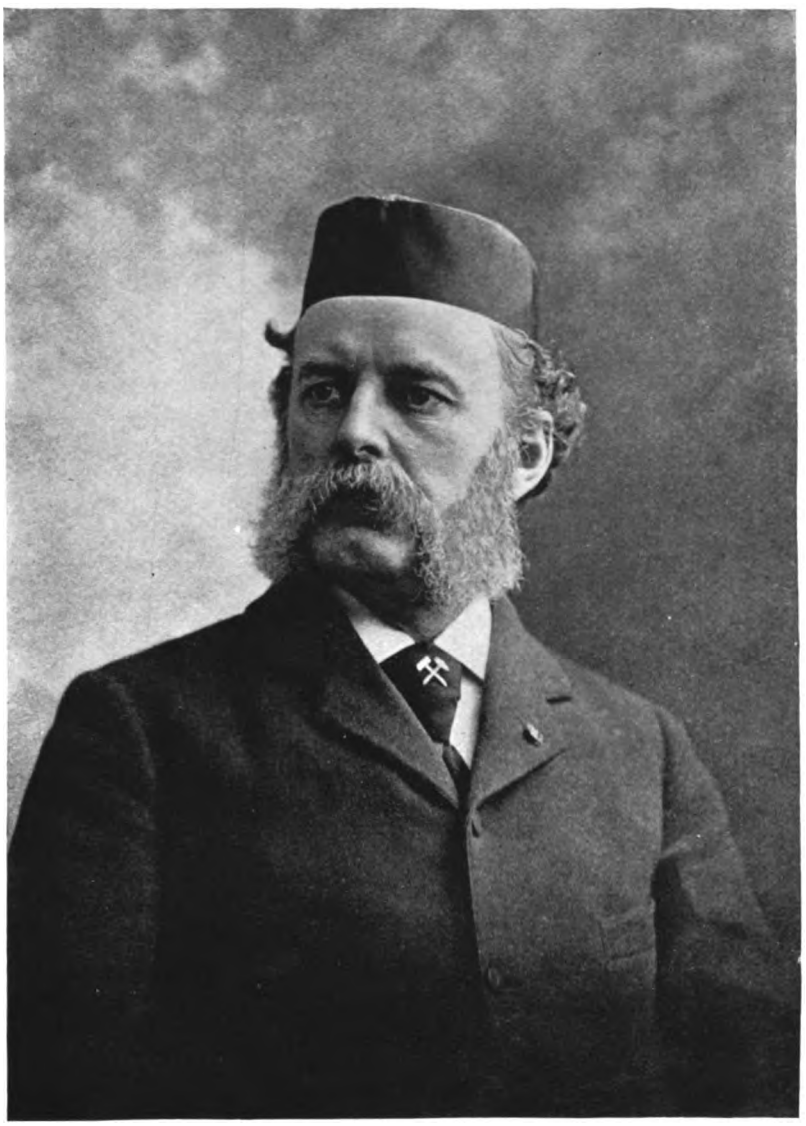
PLATE XXVII



ROSSITER WORTHINGTON RAYMOND

Entered at Freiberg, 1860, following a year at Heidelberg and a year at Munich. Ph.D. (Lafayette College, 1869); LL.D. (Lehigh University, 1906).

Born at Cincinnati, Ohio, April 27, 1840; died at Brooklyn, N. Y., December 31, 1918.

Special United States Commissioner of Mining Statistics west of the Rocky Mountains. One of the Founders of the American Institute of Mining Engineers. Vice-President 1871, 1876, 1877; President from 1872 to 1875; Secretary from 1884 to 1911; Secretary-Emeritus 1911 to 1918. A mining engineer of distinction, professor, author, linguist, lawyer, editor, story-writer, musician, poet, biblical authority, etc. One of America's most brilliant and versatile men of science and literature—and withal of wide sympathies and loyal friendships.

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SAMUEL FRANKLIN EMMONS

B.A. (Harvard); D.Sc. (Columbia and Harvard); Freiberg, 1864-1865

Born at Boston, March 29, 1841; died March 28, 1911.

One of America's gifted Mining Geologists. Harvard, 1861; École Impériale des Mines, Paris, under Élie de Beaumont and Daubrée, 1862-1864. In 1867 joined the Geological Exploration of the Fortieth Parallel under Clarence King, his associated geologists being James D. Hague and his brother Arnold Hague. In 1880 organized the geological survey of the intricate Leadville district, Colorado, of which manuscript and maps were transmitted February 8, 1883. Emmons was of strikingly modest and kind personality; of highest character and professional trustworthiness; while his work was marked by thoroughness and good judgment. His scientific publications are numerous and important. He was a member of many of the leading societies in the United States and Europe.

NOTE—The author, after graduation at Freiberg, had the honor to make his start in engineering under Emmons in Colorado in 1880.

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for law and order and for established proprieties and precedents was at the high mark then.

Looking back to our days of foreign exile, the students must all admit their indebtedness to these substantial families of Freiberg for the warm hospitality, intellectual and domestic, accorded them; and for the kindly interest in their well-being which often extended through the years beyond the termination of the course of studies. They were charitable to a fault in toleration of the often thoughtless, inconsiderate foreigners; and some Americans, too, had their wild-Indian side of law-breaking raids and pranks, outraging to the peaceful burghers by the spread of bad example. Toward all of these breaches in conventional moral codes of behavior and good manners, the authorities and citizens were good sports in their patient, indulgent, and philosophic bearing. Forestalling trouble from these escapades, there were issued to the students official identification cards, the surrender of which, in time of stress for almost any offense, acted as bonds for immediate release.

In further retrospection, the conviction grows that in those days of untainted German manhood, high cultural standards, and original achievements, there was much to draw serious, open-minded Americans into close responsive sympathy with these sterling traits and the strong national appeals to the wholesome virtues of the simple life.

The Americans and English were sociably united in the Anglo-American Club, active in Freiberg since the days of Rossiter W. Raymond—the associated Society in the United States being "The Old Freibergers in America," Charles L. Bryden, E.M. (Freiberg, 1907), of New York, Secretary, and which was formed at a much later date. They instituted, at intervals, athletic sporting contests, base-ball, cricket and skating per-

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formances, meeting similar clubs in Dresden in competitive tournaments. These events, in the old days, attracted much skeptical attention from the curious Germans who thronged the field under mental strain to discern the hidden meaning and joy of it all. On these occasions in Dresden, the queen sometimes graciously presented the allotted prizes. In this connection my recollection is still quite vivid of the time when John Hays Hammond, of Yale, though not of the long-legged Apollo type of beauty, carried off the first prize in the running contests. And this recalls the fact that young Jack Hammond was a popular favorite among the Freiberg and Dresden clubs and social circles. This was due, in no small measure, to his wholesome interest in and promotion of athletics, combined with an admirable balance of judgment in advocating plenty of recreation to season up a foreign post-graduate course of study; for, indeed, he early learned abroad the importance of keeping the mind clear and unfatigued to combat the strain of life's sterner duties, never clogging the cerebral mechanism, as it were, with surplus mental baggage. But, primarily, the secret of Jack's attractive personality lay in a kindly attitude toward others, an abundance of radiant good will, modest bearing, good-fellowship, tact, and a responsive, sympathetic nature, all of which created in him the friend-making capacity throughout his eventful, dramatic career. The blend of these traits lends a certain tinge of lovableness and quality to a man, subtle and not readily analyzed, creating in him the considerate gentleman of the heart, and more often reflecting the mother side of transmitted gentleness where the winning ways properly belong.

Hammond's disposition and temperament were not of the boisterous, voluble sort. Quite the contrary, he was agreeably mild and receptive, suggesting the composed thinker and man of action. He early showed leanings toward the practical, operative side of affairs

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PLATE XXIX

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To my friend Fred G. Canning
with cordial regards
John Hays Hammond

Freeberg - '76 - '79

PLATE XXIX

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rather than the diminutive technical details. Even then there was in evidence the latent bent to get at the heart of things by short-cut methods and direction along the lines of least resistance. He was a good, tolerant listener, appreciative and duly weighing what the other fellow had to say, while he displayed marked capacity for discerning and sizing up generally worth-while men and situations—a very much "to the point" individual, indeed, with keen perception of the play and interplay in large-scale affairs.

Through and through Jack was the American boy in every look and action. Starting on the Pacific coast, in California, and finishing on the Atlantic, at Yale, in his ante-Freiberg days, he could stretch three thousand miles more across to Europe, without the slightest contamination of his Americanism—of which mysterious complex article he had an abundance and of the right sort, all attractive and admirable. This popular and much abused term of the hour was then still in its pristine genuineness and single wholeness.

Hammond had no need to shout his Americanism from the house-tops, in public meetings and canvasses for popular favor, even had these opportunities then been open. His was the quiet, self-understood and self-evident kind, forcible by weight of its inherent high class. So it would seem the subject of this talk was "some considerable fellow"; and to say the least, for scientific biological accuracy, he was assignable to the "Wunderkind" species.

But this was not all. The forecasts of his varied talents and potential effectiveness are just beginning, so stand at attention and listen well!

His method of procedure was frank directness along common-sense lines, with little noise or friction. For instance, had he continued later on his brief run in politics and his lot been cast in the perplexing field of treaty-making, recently dominating public interest, he

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could have made an efficient contribution, no doubt, and secured decisive results with use of less than the seven million words (with more to come) and the attendant lost motion characteristic of the recent senatorial exhibitions in Washington, his present home, in patriotic services to the nation!

As a class, however, it would seem that engineers might not be expected to be the best adapted men by training, vocation, and ethical standards for aggressive political careers; or, at least, not for those activities involving personal oratorical proselyting for vote-catching purposes.

A philosopher in human nature with intriguing proclivities, not too pedantically conscientious, professionally or otherwise, and with ethics, if any, accommodatingly elastic, careless and casual with facts and fairness, would more nearly fill the bill for this particular phase of political life.

It is apparently a far cry and deteriorating drop from the sober rationale and dignity of a profession built upon the exact sciences—embodying the highest forms of truth, service, and self-respect—down to the level of the cunning tactics, subtle intrigues, and the cheap-lawyer gallery plays of hypnotic political drives. For these not infrequently call for the deliberate fostering of every device of malice, hatred, scurrility, whimsical, unreasoning prejudice, personal stultification, sweeping denunciations, and the spirit of knockers and strikers in principle and action. And, furthermore, the system often exacts the withholding of credit where credit is due; the discrediting of worthy aims and prestige; inventing differences where none exist; exaggerations of trivialities and non-essentials into "grave issues"—all at the expense of the larger things in character, capacity and service, which are purposely perverted, ignored, or smothered altogether.

The resolve to secure a following and votes, honestly

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if it may be, but to "get them" at all hazards, and the pledge to subordinate one's individual best and independence of conviction to boss dictations and partizan propaganda, playing on the whim, caprice, and passing fancy of the unthinking, credulous crowds, less fortunate in education and capacity, to rouse, inflame, and swerve them, are the entering wedges to this demoralizing departure from the cleaner consistencies and higher level of professional principle and outlook.

Between these two states of mind and ideals the gulf is amply wide for the intrusion of intellectual adventurers and conscienceless, scheming pleaders, to contaminate the better element. Filling an apparent demand and masquerading as pure reformers, they confuse and taint with hypocrisy and chicanery the political system and calling, clouding alike the standing and efforts of the really high-motived public men; and it is not uncommon for some of these to be relegated to the partizan scrap-heap as politically disqualified by reason of non-conformity—through the possession of too much sincerity in character and conduct.

Under stress of the uncongenial exactions and noxious miasma of these depressing phases of political life, Hammond would find himself uncomfortably straitjacketed and misplaced.

How effective the present system of reaching, informing, and handling the people will continue to be when in the years ahead our population shall have increased to one hundred and fifty millions and beyond, can only remain matter for speculative pondering. In any event, if it be deemed desirable to increase stability and decrease hysteria in thought and action, it would seem the part of wisdom to devise and gradually develop some more accurate and responsible régime to eliminate, as far as possible, the spread of flagrant misinformation and subtle agitation designed to deceive and mislead; but for those of the "status quo" persuasion, who hold

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that a background unreal and double must exist to bring out by contrast, in fullest relief and luster, the true and good, this suggestion may not find acceptance. Whether these campaigns of sinister motive are conducted through the press and secret societies of foreign sympathies and language or other public and private channels of information and education, the situation could be much improved and the atmosphere cleared if the perpetrators were run down and held to strictest accountability. For false news and malicious reports are slowly, if ever, fully overtaken by even the most intelligent contradiction and enlightening efforts for truthful correction; hence much of the damage remains unrepaired.

In the formative period of youth and through the many years of prolonged study and mental training, the mind and education are safeguarded with much solicitude; although the classes less fortunately situated, in point of educational opportunities, are left to drift from early years. Following the study period, the law continues to protect the individual against himself and others, in respect to physical and moral conditions and rights, and this means, of course, defense of civilization itself. Why should not the healthful condition and moralities of the mind be likewise safeguarded as the years go on, at least to a considerably further extent than now?

Since body and conduct are regulated and protected for the good of all, why should mentality and capacity for judgment in the years beyond young manhood be doomed to drift in foggy unwholesome atmosphere, without rudder or anchor, unguarded and neglected—all for sweet liberty's sake? And this problem of mind protection and fostering of healthful intelligence is of greatest importance for the very classes usually deprived of educational advantages, and who in consequence are the easier prey of clever, designing misedu-

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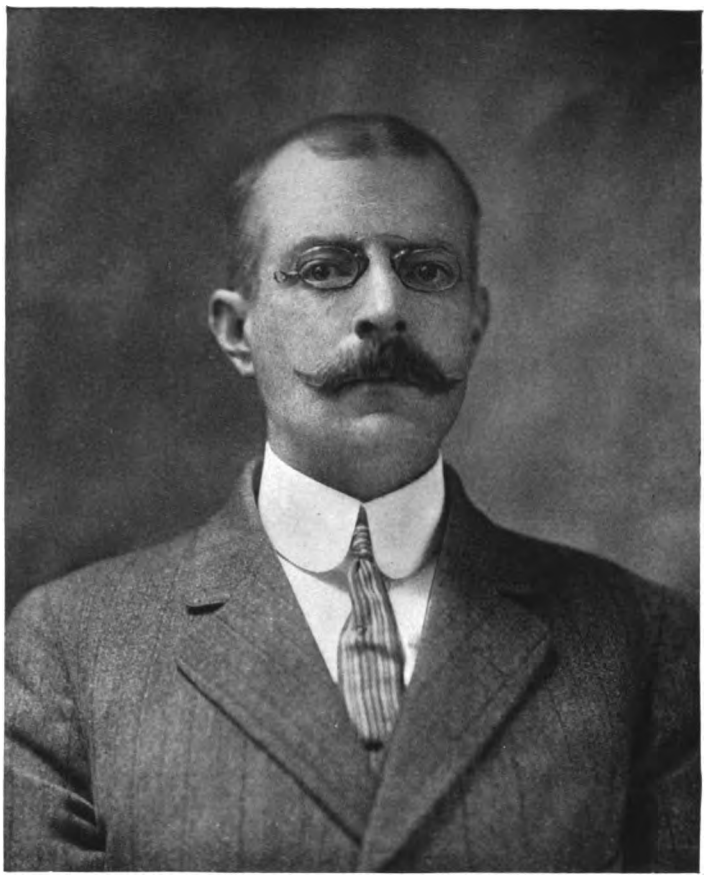
PLATE XXX



WALDEMAR LINDGREN

Born at Kalmar, Sweden, February 14, 1860

M.E., School of Mines, Freiberg, 1883; LL.D., Princeton, 1918

Now Professor of Geology at Massachusetts Institute of Technology. In 1883 joined the Northern Transcontinental Geological Survey under Raphael Pumpelly, organized by the Northern Pacific R. R. Later geologist with the United States Geological Survey, employed in the special study of metal-mining districts. In 1907 was put in full charge of all the U. S. Geological Survey work in metal-mining districts and metal statistics. In 1898 Associate Professor of Mining and Metallurgy at Stanford University. From 1908 to 1910 Lecturer at the Massachusetts Institute of Technology on economic geology. Lindgren is an accurate and well-equipped observer and interpreter of mining geology—his mind running specially to the physical conditions under which the vein and ore minerals have formed, such as high temperature, medium and low temperature minerals. Among his works "Mineral Deposits" is widely known. His professional standing is of the highest.

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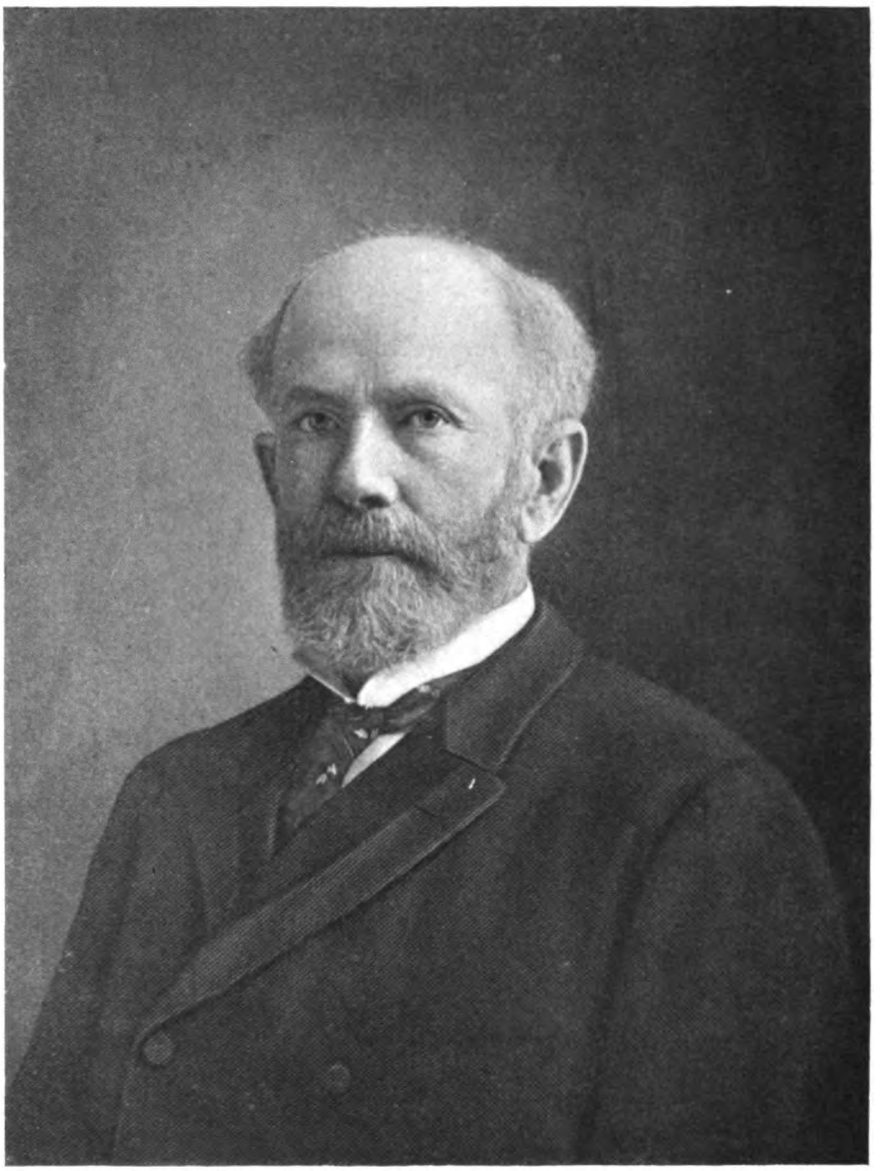
PLATE XXXI



JAMES BENTON GRANT

Freiberg, 1876

Born, Russel County, Alabama, January 2, 1848; died at Excelsior Springs, Missouri, November 1, 1911. Governor (Dem.) of Colorado, 1883-1885.

One of the founders of lead-silver smelting in Colorado: the Grant works at Leadville; the Omaha and Grant Smelting Co., eventually merged into the American Smelting and Refining Co., the largest concern of its kind in the United States, if not in the world. Grant was a Southerner of high quality, and of gentle, modest personality. He was a sterling character, and Freibergers knew him to be a congenial, true, steadfast friend. As Governor of the State and the head of large corporate interests, he became an important figure in the rising social, political, and industrial life of Colorado- a leading citizen highly respected and beloved by all parties and classes.

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cators—the bandit intellectuals of depraved design who undermine the fundamental standards of law and order.

The pity of it all—that we, among the scores of millions who must perish in the effort of preparing the way for others, may not for our pains even be spectators to watch the fray and listen to the praise or censure for our daring efforts and counsel, as the case may be!

As monumental records of all of the wear and tear of our political contests in time, words, and sentiment, inexcusably wasteful to the casual observer, are the hundreds if not thousands of tons of controversial literature, much of it of the cheap fiction, dime-novel style of exciting, extravagant presentation, all making for the bewilderment and consternation of a considerable section of the indulgent, confiding community.

Everything being styled as "fair in politics," the broad license, suffered by usage, in the methods and procedure of the "outs" against the "ins," goes even beyond the limitations of the judge-controlled ethics of courts of law; and the secret rankle of the one unpardonable crime that the "ins" are "in" and the "outs" are "out," accelerates the lowering standards of the contest. All ambition for lofty statesmanship in truth and principle, relegated to worse than secondary consideration, becomes superseded by animus and sinister resolve for personal revenge and displacement. The canvassing is cloaked in cunningest plausibility of presentation suggestive of the brilliant, gifted criminal-lawyer type of mind, struggling on the wrong side to defeat the ends of justice.

Moreover, in the heat of this splendid contest, developed in the friction of partizan debate and fervor, the paramount interests of patriotism, welfare of country and individual, are overshadowed by the smaller aims of spite, envy, and personal ambition—not what is best or should be, but what can be put over for the cause of dispossession!

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Such are the distressing, anomalous situations in politics that would naturally grate on the love for fair play, and dampen the enthusiasm of the Hammond type of sensitively organized college man.

But the veterans in this temperamental department of human affairs have only compassionate smiles for the uninitiated. They understand, as did old Barnum, our instructive circus philosopher and prince of entertainers, the wide demand and high market value for "humbug's" mission divine, to work the public and eliminate the drag in serious pursuits. And was he not also a great (circus) *constructive engineer?*

Thus in this broader aspect, the froth and bubbles of our politics, apparently the indispensable accompaniments of progressive governmental wisdom and improvement, might find charitable interpretation by a senatorial psychological economist, as the fire-works of human nature—a form of beneficent humbug, as it were, or a useful poker to stir into glow the slumbering embers of the torpid mind!

And so our ever resourceful, wiggling politician would contend that his function is quite up-to-date in economics and well in line with natural science, against which "his system" commits no infractions of nature's laws; and moreover, that any "wasted effort" by "his kind" is either only apparent, or, if present at all, serves the important mission of mental seasoning for the fray, which at the very worst is but the political poker-bluffing of our national life—all part of the greater game of living and succeeding! His economists he would quote, in their expounding of "Nature's way of doing things," as proclaiming accomplishments achieved only by greatest prodigality and waste of natural energy and resource—as, in mining, the winning of the precious metals involves the high cost of prospecting, then of handling and disposing of much waste rock, slag and

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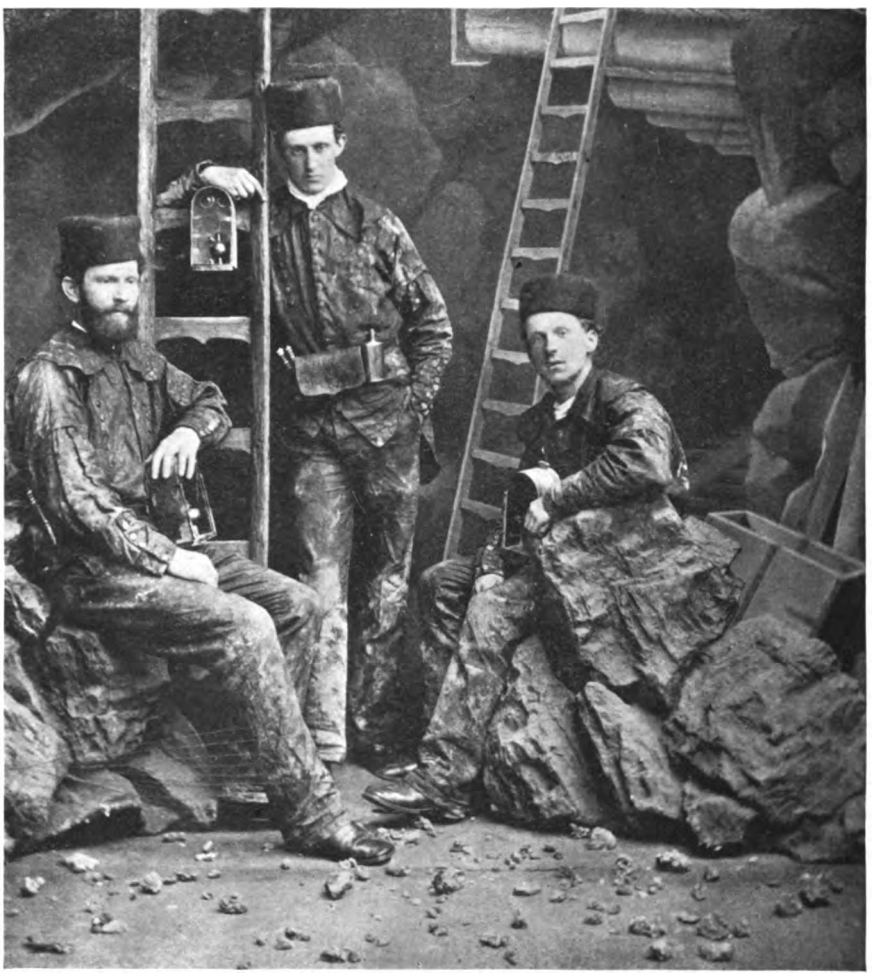

AN AMERICAN UNDERGROUND THREESOME
Freiberg, 1877
James B. Grant on left—later on Governor of Colorado

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PLATE XXXIII

AN INTERNATIONAL TRIO OF CONVIVIAL FREIBERGERS
1875-1880

In dress uniform of the Academy
Good old England, the United States, and Canada
Messrs. White, McKee, and Pratten
Pace-setters in "liquidation"—
at its height, when not to drink copiously was bad form

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dross, besides actual metallic loss in process, before the pure bullion bars become available for market!

Hence the exasperating but entertaining man of politics, in his boundless assurance and plausibility, ever ready with wily, wriggling rejoinders, comes dangerously near convincing us of his abundant fitness for professional recognition and admission, qualifying as our marvelous composite oracle: a Mephistopheles-expert in human nature and consulting engineer of the political machine—the biggest motive forces in American fevered life! Yet we must insist on one reservation, forever non-destructible, and for self-preservation: that engineers be not pledged to the exciting ethics of our new member's loose talk and shifty ways, permissible in his calling, perhaps, without loss of standing or job, but not so in ours.

By way of reciprocation, nevertheless, and without the popular "reservation or amendment," we joyfully accept him henceforth as our invigorating excitant (after business hours!) now that cocktails are relegated to the secret vices. And under this new stimulus, but still fondly recollecting the old vitalizer, we discover that a change of angle means change of outlook; and that if ever-evolving viewpoint and setting form life's panorama, a politician's status must be among the higher vibrations of molecular activity, creating him, at one stroke, an object of deepest scientific interest. Mexicans, too, thrive well on these rapid changes; and the Irish, no less, who most surely excel in war and death —and in peace that's never peaceful; while under this law of rapid change even a funeral becomes a cheerful holiday invigoration—if only under Irish setting!

Again in the ecstasy and cozy intimacy of this belated discovery, and the plighted mystic union with our composite-oracle, a sense of possible guilt possesses our anxious souls, lest through narrowness of conception

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we have too long withheld compassionate indulgence for this latest of living hypnotic fads. For, since his conversion to the higher ethics, and craving forgiveness in touching, silent penitence, his one pious confessional whisper is that he "wants to be good but he dassent." And now in all sympathy, and in the ever enticing and hopeful vision of enduring reform, his past trials begin to loom big with purifying intent; so, in the dazzle of the moment, our new-born political evangelist at last shines out with ever-increasing halo-radiance, as of the glorious martyr days of hero persecution.

Indeed, in this liberalized view the political temperamental spellbinder, by dint of his persuasion, now looms up in the majesty of a serious competitor among the dry men of science; and, "for richer or poorer," as he has taught us to obey, we take him in for peace on earth and good-will toward men; and incidentally to add his favor to our waning assets. But Barnum, too, must be included—that the fall from grace may be entrancingly complete, or can it be to consecrate for bigger feats? Which shall be our fate, since thus we learn to say Amen to many things?

After all, then, the startling exceptions in nature, the big things and events, are what save and count; and might it not well fall to the lot of a lucky Freiberger to become one of the shooting stars of unequivocal clean purpose and yet good fortune in public life? This should occasion no surprise, for it has been conclusively shown—or is about to be—that no limitations can be placed upon the high reaches in capacity and performance that a disciple of this forum of science may attain to! And have we not also seen that such an one, from earliest beginnings, is an expert interpreter of the "freaks of Nature," deep down in the earth and on its surface alike?

Accordingly, for the everlasting renown of Freiberg mining engineers, we must insist that Hammond could,

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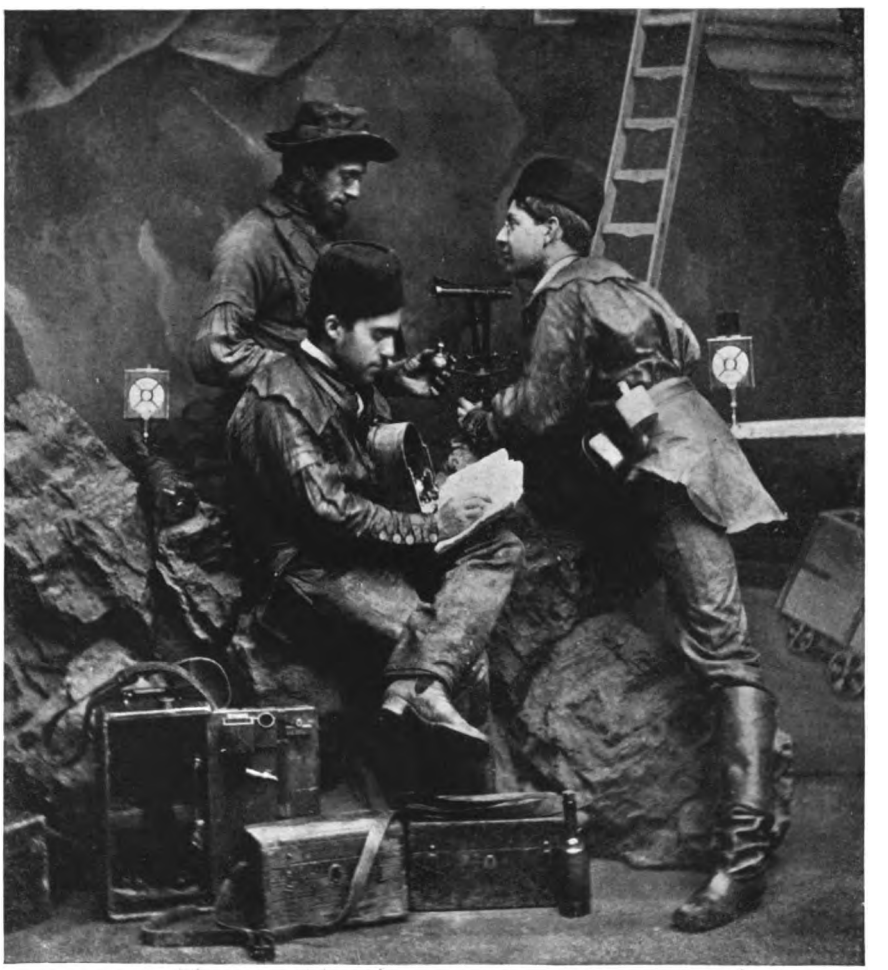
PLATE XXXIV



A FREIBERG MINE SURVEY PARTY
1878

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PLATE XXXV

AN UNDERGROUND ANGLO-AMERICAN QUINTETTE
Freiberg, 1877
Franklin Guiterman of New York holding hammer on knee

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perchance, have ironed out into homogeneous concert of agreement and action on a precise basis for enlightenment and world improvement, the bewildering discordant chorus of the noisy political factions of the hour, all boasting in partizan exploitations the exclusive discovery and monopoly of the one genuine Americanism worth while. Only the ability derived from Freiberg's charmed life could produce a mining engineer to cope with this political menagerie of dispositional marvels in the hectic atmosphere of party contests, picturesquely dubbed: the bitterenders, nullifiers, near-nullifiers, mild reservationists, atheistic reservationists, plausibility experts in constitution twisting, quack medicinizers of public opinion, Article X misinterpreters, reactionaries, peace-breaking political engineers, oppositionists, Roosevelt Ananiasists, obsessional oppositionists, irreconcilables, contemptible quitters, etc. Witness the spontaneous, haphazard creation of our transitory American titles of democracy's court at Washington compared to the far greater Freiberg assortment of jaw-breaking clang, thundering with imperial sanction and permanently anchored in the very rocks of geologic ages!

The task of orderly classification and subdual of our acrobats of the political arena, some worthy and well-intentioned, could not have added to Hammond's surprise or consternation after his world-wide experiences in Freiberg and other collections of curios, and his subsequent wanderings in all quarters of the globe, because he was from all time designed for a tactful, far-seeing man, out to conciliate and win. Making a political foot-ball of a great piece of constructive work and of the word Americanism, daily inventing corruptions of this thrilling slogan, would be in the line of a versatile mining expert to circumvent; and reinforced with Yale foot-ball credentials, among other things, he could handle well a jockeying game.

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But Hammond may tell us he could do nothing of the kind, and that these titled seers of the new world, as of the old, are his particular friends, all wholly in accord; and, furthermore, that he accomplished little at Freiberg and learned less. But don't mind him; these are merely the cautious, modest disclaimers of a more modest man. Come what may, we shall not tolerate the Academy being robbed of the prestige of his success. It needs it all at this very moment! In any event, he will not deny he had a grand time learning there that he had much yet to learn and some day must get busy filling out the missing links—so some progress was, after all, recorded. Anyhow, it mattered little, for Freiberg's name and magic carried a long way! Moreover, the "Vaterland" propaganda of the Kaiser, in all his glory, proclaimed all big men and things to be German or of German origin; even Adam spoke the language, and Eve, of course, more so. It follows by royal sanction, with equal force, that all real engineers are Freibergers; so come what may, we are safe and sure for all time. But for magnanimity and solace to the less fortunate, forever condemned to mediocrity, we acknowledge some embarrassment at the riddle of science still unsolvable: how mountain-peak men of the Wilson, Hoover types ever came to be without Freiberg at their backs! And this suggests that to foil the unreasoning, vehement allegations of shortcomings heaped upon our leaders in direct proportion to their superior power, patriotic purpose, and services performed, and like manifestations of human weakness and imperfections, the Freiberg perfecting germ must in the last analysis forever be the cure for accuser and accused alike! Could mortal man ask more from foreign education? And let this be no jest, for does not a mining engineer's training cover in its versatility, practical and academic as recorded in the foregoing pages, all that's known inside the earth, on its top and heavenward as well?

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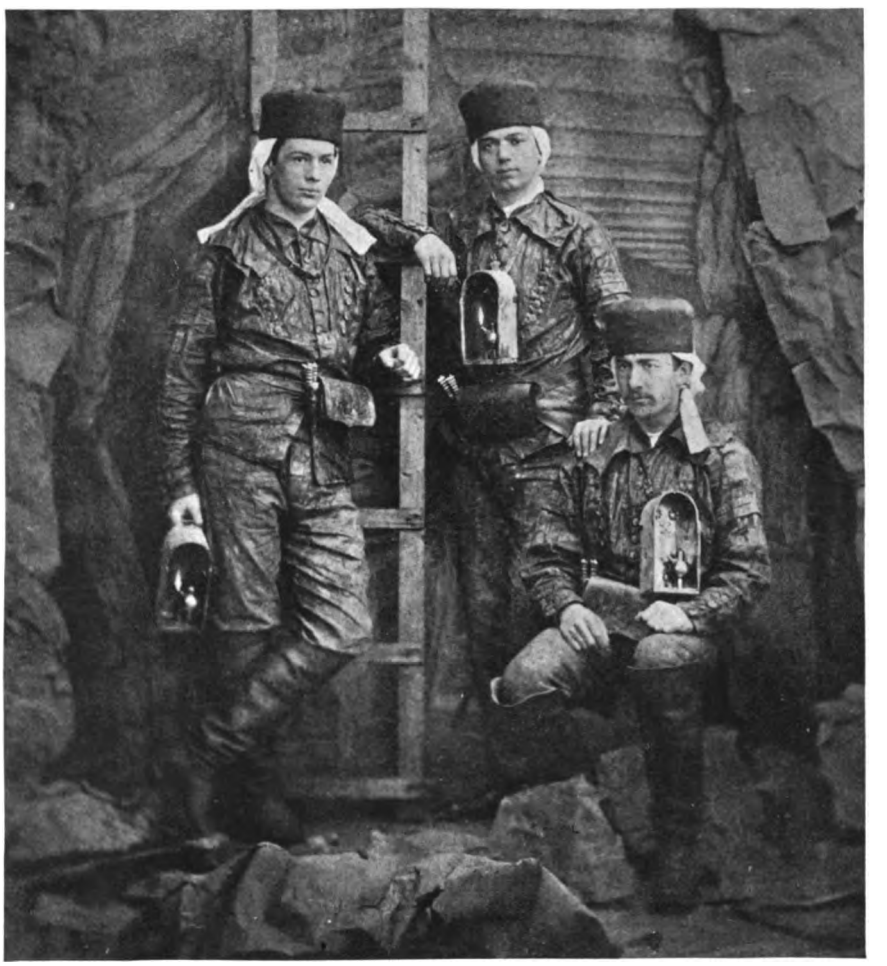
PLATE XXXVI



A YALE FREIBERG TRIO (1877)

Cunningham Hawley Hammond (John Hays)

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PLATE XXXVII

FREIBERG SUPERINTENDENT IN PARADE UNIFORM

FRANKLIN GUITERMAN AT FREIBERG, 1877
A leader in American Metallurgy

A GERMANIZED AMERICAN FREIBERG DANDY
of the early corps student days
(A. J. Bowie, Freiberg, 1864)

EDGAR P. RATHBONE
of London and South Africa
(Freiberg, 1878)

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Again, in more serious strain but not forgetting for a minute our chronic student conceit: The proposition is advanced that of all the different national combinations of Freibergers, the American Freiberger enjoyed the best chances, other things being equal, of eventually attaining to relatively superior position in breadth of intellectual development, balanced judgment, and fitness for leadership in any community, over a wide range of human activities. More than mere loyalty and enthusiasm for one's foreign Alma Mater seems to warrant this bold claim, made by a student with a background of generations of purely American ancestry on both sides. For in this educational union we must surely recognize the inimitable effectiveness of the American foundation of natural alertness and practical versatility, bred in the very air of new-world movement and expansion—coupled, in the maturing years of education, with the seasoning influences of old-world substantialities. These consist chiefly in thoroughness of investigation and methodical procedure, all nurtured in the infectious atmosphere of inspiring traditions and those high ideals which attain to fullest ripeness under the inherited sturdy character and solid standards of the older countries—conditions born alone of long centuries of earnest endeavor. Then, too, while old Freiberg was furnishing the very useful cultural opportunity of acquiring one or two foreign languages, it afforded concurrently the broadening experience of meeting many different kinds of people of various nationalities and corresponding diversities of viewpoints. Functioning on these lines as a supplementary educational field, all of these facilities were at their best during the middle period of the institution, long before the material decline of the Freiberg mines and the subsequent lamentable moral bankruptcy of the German Empire.

Finally, then, may not the merits of the combined educational system, American plus European, even now

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be gratefully admitted, without humiliating disparagement of our own capacity or expressed disloyalty to home and country? And, smart as we were and are "over here," may we not still benefit by the "over there" ripe experience and learning in all departments of human affairs, for their invaluable finish, repose, and tonic-brace, in solidifying and rounding out our American education, our outlook, and our judgment capacity?

Fortunately, in things academic and intellectual, the paralyzing doctrine and insidious microbe of *deadlevelism*, so popular in certain other departments of local thought, have not so far broken into educational standards as to make it thoroughly bad form, if not an unpardonable sin, to have been somewhere, seen something, and done something! The opposite contention means that we "have arrived," know it all, and prefer the lesser burden of responsibility of stagnating undisturbed, within a narrower horizon of knowledge and outlook; thereby avoiding all progressive risks of dabbling in world knowledge and affairs beyond our own borders, and camouflaging the retreat by morbid waves of withering denunciation of European standards and worth. In thus securing exemption from excommunication by the fashionables of fiat conservatism, and escaping banishment among the "undesirables" and "visionaries," we subscribe to one of the most dominating of the *à la mode* preaching fads of the present kaleidoscopic times. But, if optimistically inclined, we may assume this eloquent creed of contraction and premium on laziness to be only transitory. In any event, we confidently look for its rapid decadence after fulfilment of its ulterior mission to establish a guardianship over respectability and legalities and as a salvation-device for conversion from the backsliding errors of our ways! Mayhap this forecast will prove true with time and we may yet "look about a bit" and admire without suffering accusations of heresy.

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PLATE XXXVIII

A REAL GERMAN BEAUTY
Fräulein B.M.

In costume of the classic period as heroine of the Flying Dutchman, combining the German ideals of music, face, figure, and domestic thrift.

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PLATE XXXIX

CÉSAR VICUÑA, E.M. (FREIBERG, 1878)
of Valparaiso, Chile
Graduated at Freiberg about 1881

A picturesque member of our South American coterie in fancy dress for a Dresden ball. The gifted son of a prominent Spanish-American family of old-world culture and power. An attractive boy of Parisian tastes and ideas who knew life and aspired to miss nothing. Attaché of the Chilean Legation in Paris. An accomplished linguist and violinist, scholar of Charles Dancla of Paris. My genial chum and roommate.

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Engineers, as a class, are forward-looking, forward-moving people, preferring this function to side-stepping and retrogression; and, like most other persons, they are at their best in an optimistic attitude of mind and in the more genial practical activities of construction, upbuilding, growth, and expansion—in contradistinction to the rôle of dyspeptic immobile beings freely dispensing wise counsels and warnings to cover poverty of resource and inaction.

There are in the American Institute of Mining and Metallurgical Engineers alone 8500 members; and with the other three foundation societies, the Electrical, Mechanical, and Civil Engineers, plus the membership of various other professional branches—all centering in the Engineering Societies Building, 29 West 39th Street, New York, gift of Andrew Carnegie, the great and good —over 60,000 of all kinds of engineers, representatives of a total of 300,000 (including assistants) in the United States. In the ocean of knowledge and achievement represented by these architects of civilization, modest old-fashioned Freiberg may indeed appear as a small drop—but of quality "high grade," all pure and sparkling, nevertheless.

Fortunately, the disintegrating, dissolving, and "unscrambling" of the complicated relations and delicate adjustments of civilization, won at great cost, are not the preferential ambitions of the profession or the dominating occupations and motive forces that move the world. When the "blind staggers" of present confused ideas and abnormal activities shall have run their course and the bleeding operation subsided, the community will feel gratefully relieved; and perhaps the reformers, too, will appease their anger toward those who have achieved and continued unreformed. Meantime we are hoping on that the extreme, half-baked theories and propaganda of the times may die like germs in the sunlight, and that enlightened reason, restored standards, and a healthful outlook will dominate once more.

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Luckily the broader and truer democracy in things technical, academic, and scholastic is still preventing the intellectual, corporeal, and moral isolation in these fields, so plausibly urged in respect to many of the other great questions of the present complex period, as the Holy Trinity of conservatism, safety, and good morals.

May it not well be, however, that these post-war tendencies to doubt, deny, question, reverse, and react are also remotely, if not directly, the jarring reflections of the seemingly incurable shell shocks that produce the hard and crazy aftermath of war? Sent traveling around the world for years, the stupendous, paralyzing concussions and upheavals in the bulwarks of civilization have made slow-healing if not irreparable breaks in the body politic and in established order—as in mining geology we first became familiar with faults, drags, and dislocations in continuity of strata and formation, resulting from huge, immeasurable dynamic forces breaking through zones of least resistance.

* * * * * * *

Through this world tension and twisting and the concomitant corrupting inroads, the post-war reactionary weaknesses of human nature have been brought to the surface in specially virulent forms. Severely infecting all walks of life, tainting the mental and moral attitudes, and unsteadying alike the normal viewpoint and poise with debilitating irritability, there quite naturally arose in this vast movement of unrest and world neurosis, a yearning for revisions, reversals, and drastic shifts at any price or risk, all under pressure of the distressing replacement of optimism by pessimism. And at last, by reflection, the demoralization in the affairs and morale of the human family in resentful protest culminated in a common outcry of despair and revenge, in which even now the world welters. Discarding philosophic solace, and longing to put the blame somewhere, the injured, in menacing temper, sought relief in vituperation and

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NORTH AND SOUTH AMERICA AT FREIBERG
in 1878
Frederick Gleason Corning, New York. César Vicuña, Valparaiso, Chile

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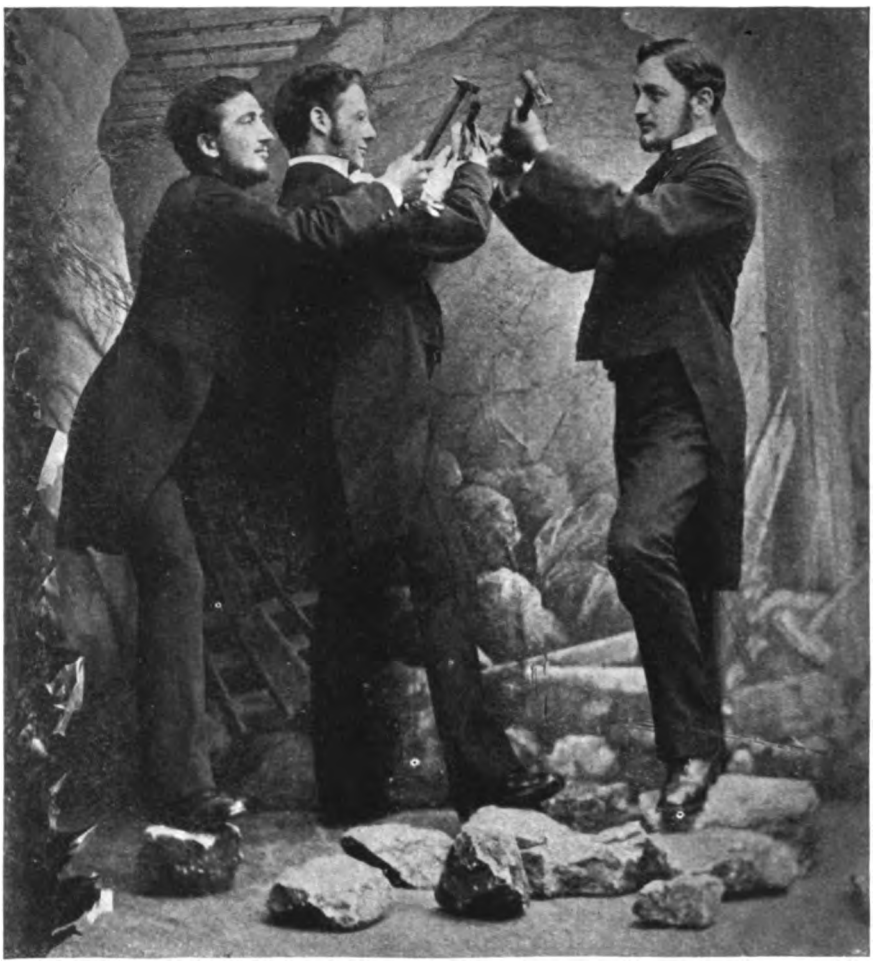

A TRIO OF KID-GLOVE MINERS
Freiberg, 1877
E. Stoiber F. Corning F. Guiterman

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careless denunciations of past leaders, regardless of merits or equities.

These highly wrought-up nervous conditions of mind and body, among non-combatants, arising in part from strains of business, high living costs, and taxation, as well as among combatants for the more direct war stresses and suffering, having extended perceptibly to the New World also, the politico-economic soil and atmosphere here became sensitively receptive to exploitations by the restless, and by designing interests. Conformably, therefore, the fields of regular periodic politics became alike richly fertilized for the cultivation of flourishing crops of partizan activities, albeit on a not altogether righteous basis of truthful presentation.

Little surprise, then, that in this war-torn era of convulsions, and buffeted by the forces of chaos, correspondingly new and strange elemental groupings had logically to come into being in national affairs, quite startling even to a peculiarly toughened political conscience. Strikingly entertaining among the novel, eccentric combinations befitting the times—the last word, as it were, in our involved political chemistry—will long be remembered the affinities, now sympathetic, but perhaps once incongruous, genially united in the mystical symbol H_4, and familiarly known to the talent under the operative name of "Hearst, Harvey, Harding, and Hyphen," expert engineers in partizan politics and plausible crystallizers of national discontent into resistless, tidal-wave majorities!

Around these political centers of gravity there rapidly gathered in concentric kernel, throngs of embittered, mongrel spite elements, powerfully sustained by press organs commanding as well huge and highly respectable capitalistic following—all culminating in the sweeping reactionary party under an old and honored label. Especially featuring and expounding the Higher Americanism, so styled, scoffing at ideality and specific measures won for world coöperation and betterment, even plac-

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ing the stigma of rejection thereon, the shrinking provincials became all the rage, and "quite the proper thing" as the recognized panacea of the hour for past and future ills, actual and imaginary.

Running true to form while still the ravenous "Outs" party—propagandizing through cunning editorial detractors and functioning by shrewd design as the storm center of New World waves of post-war slander, hymns of hate, hypocrisies, and "strafing" vindictiveness—they quite naturally became the peeved aliens' idol and political delight; while the records of the perversions, vehement denouncements, and extravagant "life saving," "safety first" bids for favor which formed the undercurrent of the overwhelming campaign of the opposition in molding public opinion, must ever remain faithful replicas of the genuine Old World Vaterland articles—worn out over there, perhaps, but decisively winning out in our home political market. As connoisseurs and manipulators of human nature, with coadjutors drilling into bitter discontent every chequered alien faction and war rancor, they readily multiplied into strongest, widespread opposition the protests and calumnies of the tarnished partizan composites of many views and faces. History will not deny them full credit and glory as brilliant retrogressive reformers, and for having lent the nation, viewed from afar, the complexion of sweeping domination, as it were, by a "Sulking Party of the National Sneer." For, after all, it must be candidly admitted that politicians and their methods, with plenty of time and organized "facilities" at their command, are, primarily, the real molders of opinions on politics and policies among the busy, overworked American public.

From now on, however, since the decisive victory of a campaign historically unique in purposeful distortions and animosities—befuddling issues and confusing the people—and after the successful advocacies of parochial contraction and retirement, with the telling strategic advantages of wide-spread war-unrest and policies of alien

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coddling and pacification, there may be expected to be resumed creditable efforts and deeds, "as per secret covenants" confidentially exchanged!

But, may it not be in the judgment of time and an impartial world that historians will record some of these latest plausible leaders, victorious in numbers, as triflers and turncoats—brilliantly eloquent and of beautiful political iridescence, although less luminous in logic, consistency, and high patriotic quality! And yet, on second thought, the new powers may sullenly conclude to follow along the discarded high plane of outlook and principle as struggling but reluctant imitators of their predecessors, and build on the enlightenment and basic achievements preëmpted from past distinguished services of a courageous and practical leader of humanitarian soul and vision.

Having cultivated, adequately long, popular contempt and ingratitude for patriotically performed services along broad lines of leadership in practical ideals which lifted America into highest moral and intellectual world credit, a descent to the lowest degrading ebb of double-dealing partizan trickery was resorted to by the opposition in the whispered promises of the elements of chronic envy and discord "to behave if let in," and to drop their effectively "staged" persuasions morbidly cooked up for timid public campaign consumption. Serving well their purpose as drawing bait, these belated professions may also be regarded as hopeful signs auguring well for eventual return (after further trying delays, to be sure) to the well-beaten reassuring track of cheerful progress and construction. Yet, on the other hand, perforce of circumstances, it may transpire that our new leaders will literally live up to their declarations for reversals of triple hyphenated taint, and perpetuate the slander on our national character by continuing the un-American withdrawals and poutings of the new Americanism, in its adopted rôle of the timid *enfant gâté* in the family of nations—precariously folded in the austere

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banner of the strange device: "America last in Big Things but First in Cash, Comfort, and Political Rankle!"

Indeed, in philosophic forecast, it might well have been expected—under pressure of the mental resourcefulness of our national political legerdemain in cunning originality of subtle appeal to the timid and suspicious—that the spleenful plasticity of the heterogeneous citizenry-matrix, together with the confused irritation of the world tumult and the post-war spiritual relapse, would readily lend themselves to reactionary propositions and rapid evolutions. And it seems natural, moreover, in the development of the political frame of mind, especially among the masses, under these unusual and trying circumstances, that such basic character qualities in human nature as suspicion, envy, petulance, casuality, and gullability should have played up with eager response to the superficial appeals and patent nostrum harangues of the high-motive reformers!

Like the sick, sullen animal that snaps at his benefactor, so the tired, sore citizen, in his outcry, "I am mad clear through; leave me alone and don't bother me," furnishes also a homely photograph of the average public temper which makes for stagnation, but preferably for reaction, under the ever accommodating guidance of the sympathetic climbing politician. But not *quite* all of our ills and wabbling faith should be charged to the public man, for, accomplished talker that he is, he automatically converts *himself* along with the rest, and so earns our charitable consideration. Moreover, by way of further consolation be it recalled that, even the slippery eel has his place in nature (all unconscious of his smoothness), though at his palatable best when dead and pickled. Then why despair of the politician?

But still the ebullitions of this virile epidemic of change, and the transition period of healing reconstruction now supposedly entered upon, with their seasoning, settling-down processes, pursue their tortuous course with but slight diminution in the clouded uncertainty of

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home and world affairs. Evidently, therefore, the economic pressure must continue to run its true-to-nature course after the unparalleled destruction of wealth and life and the creation of world-wide unhappiness. But in all frankness, must it not be admitted that a brake could have been put upon the destructive extremes of reaction, and the dire consequences of the war substantially alleviated, by America pulling promptly and serenely *with* instead of hysterically *against* the rest of the world!

In more than one way, this forced and quite unexpected basic situation has made for far-reaching irritations and bad blood; besides setting a deplorable precedent, by invitingly opening the path for collateral disagreements, wide-spread skepticism, and vanishing credits, during a super-sensitive period in world affairs.

Healthy internationalism, honestly understood, is not incompatible with nationalism high and noble in intensive quality. In fact, if properly approached, both conditions may be brought into correspondence for greatest mutual benefits and progress. But well-intentioned effective "approach" can never be achieved by failure to contribute in a broad spirit of helpfulness, free of suspicion and duplicity, to the restoration of the world's stability. Nor can beneficial up-building results be obtained by stubborn insistence on the shortcomings and wickedness of Europeans and by timid partizan warnings, largely for ulterior purposes, against the dangers of involvement.

Should it not eventually become evident to the common sense of the community, exclusive of certain colored views of chronic partizan politicians, that gross injustice has been done through ten thousand speeches and some ten million words, in wilfully misinterpreting the spirit and provisions of the great established program of League international relations, and artfully withholding or denying favorable facts relating thereto; and that many of the people's representatives, through malice or stupidity, besides thus abusing their trust, have

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allowed the nation's affairs and most pressing problems to take a back seat, neglecting or wantonly rejecting vital measures, while personal feuds and partizan contests were being fought out?

The poor abused League, deprived of the partizan invention of the "best minds"! Battered and reviled by them, it has fought the good fight of faith against envious enemies. These invariably appear en masse when reform is in the air and when the tread of a great humanitarian forward movement is courageously making itself felt in the world. That bundle of hopes and fraternal good intentions, leagued together by *others,* with only "near-best-minds" behind it (as the rebellious League critics of competitive aspirations find comfort in maintaining), is still marching erect—craving forgiveness of the "best minds" undertakers for living and functioning.

To the utter consternation of its enemies, the first year of the League's activities in organization and administration has conclusively demonstrated, in the light of actual rulings and interpretations, that no adequate warrant exists or ever did exist for the learned extremely adverse opinions of "enlightened America," *collectively considered.* Alarmingly spread throughout all lands, by the distinguished "best minds" experts of the pure and disinterested opposition, the "rejections" were, on the whole, primarily for the ignoble purpose of discredit and destruction; while any indications of real solicitude for the improvement of the League draft were of secondary moment only, if not for pretense pure and simple. Evidences of bona fide intent to contribute helpful coöperation to its up-building were rare, indeed, although the motions of such unalloyed patriotism and disinterestedness were admirably rehearsed and enacted with excellent dramatic gallery effect.

The furious colored dissections of the document respecting its aim, effect, constitutionality, etc., reduced to their lowest terms, must, on the whole, be relegated to the high and holy partizan order of the "tempest in

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the tea-pot." But, nevertheless, the discrediting outgivings, ringing with profound expert authority of "best minds" monopoly, contributed in decisive measure to the general confusion and shuffle of the hour—rendering real enlightenment and progress most difficult of achievement.*

The American tendency, long manifested, especially among the new powers that be, to disparage the League's work and its earnest efforts for successful growth, and to glory in the slightest indication or threat of a setback in its development, denotes a mental and moral perversity utterly at variance with our otherwise high national character. Out of the long list of false, malicious statements made about the League, before and during the campaign, none matches in political insincerity the contentions (*a*) that the League was put together by inferior and inexperienced minds; (*b*) that it will promote wars rather than tending to decrease them; and (*c*) that it was devised with sinister intent. But the worst is yet to come, for, among certain factions of the opposition, no effort is spared to bring to bear any pressure that may make for its total dismemberment and destruction.

These revelations are surely dreary commentaries on the note of nobility and fair liberal-mindedness, supposedly grounded in Americanism (the much abused term), which qualities as to this vital measure are so distressingly lacking. Indeed, this spiteful attitude of mind and heart toward so great a world undertaking for betterment, is a record of lasting disgrace to our country.

* Well-intentioned inoffensive "Reservation" trimmings, in homeopathic yet liberal quantity ungrudgingly urged (ever acceptable to the League's authors), would have adequately clarified and rounded out any rugged corners of the "writ" without tending to weaken, mutilate, or nullify; or throw into confusion the Organization and its Members. Had such reasonable aspiration and concession been acceded to by the "slighted patriots of the opposition," and accepted by them as a sufficient patronizing sop to appease their wrath and placate timid critics, America with her mighty power and prestige would early have rounded out and taken her place in the forefront of this greatest and most promising humanitarian experiment of the ages.

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Practically considered in the large, the first serious generic trouble with the great, intelligent Treaty-League work and draft is seen to have been the disheartening revelation that *other* "best minds" got there first and produced it; and that there was neither necessity nor room at the feast table for *all* the "best minds" in the world, or even for all those in America, for that matter, to join in the honorable job.

Frankly scrutinized in practice, the League is found to function with such harmless, stingless simplicity in regard to fixed trying obligations, that the bugaboos and terrifying commitments heaped upon it by American interpretation rapidly melt away, greatly to the disgust of the legal lights and other partizan prophets of involvement and disaster. Infallible as the lay-mind hopes and expects expert opinion to be, in its dependability in all of the complicated departments of human affairs, there is still observable a long record of miscarriages in judgment among professional super-minds—even of those brilliant citizens and legislators learned in the law.

So, after the many grave ominous contentions and warnings about the "iniquitous document, wicked and accursed," it appears the League representatives at Geneva are only asked to be directly amenable to instructions from their own respective home governments; and it develops that little more is expected of them in actual pledges than contributions to debates on mankind's sins of omission and commission; and, finally, to facilitate and popularize combined action for peace and fair play with a forceful united influence hitherto unapplied on so large and systematic a scale for the enlightening and stabilizing purposes of civilization.

How thrillingly shocking are all favorable disclosures and developments in League matters, to the small, select coterie of the fully monopolized but nearly extinct "best minds," hitherto undiscovered by, and consequently inaccessible to, the "stupids" gone before!

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With the lapse of time, truth is becoming plainer. But the tide of narrow tremulous outlook and policy in international relations has been so long and effectively set, and public opinion on the League question so debauched, that in all probability they can only be reversed with much difficulty, if at all. Our greatest of opportunities, in exalted mood for noble purpose, may have been forever lost in the receding waves of finest emotion and idealism.

There is something attractive and speculatively appealing to the sanguine, visionary, and highly wrought-up public, about the hopeful reassurance and superior mindedness implied in the mental attitude of an opposing leader that nothing established is good enough for him; and that the work of other honest, competent men is but the amateurish melange of half digested ideas and obsessions—while the real man of mysterious powers with the "perfect" article up his sleeve is about to be heard from! But then, on the other hand, too much must not be expected of poor, frail humanity.

Indeed, under the shadow of the flood of undeserved hostile criticism and cynical prophesies in senate debates and campaign oratory, it would be no small humiliation and strain to personal pride, at this late day, to rise, for honesty's sake, to the character-heights of confessing early error and heretical teaching in League matters. To feel and also yield to an enlightened repentant impulse "to tell the whole truth and nothing but the truth," squaring intellectual with moral honesty, would call for real character, of quality and amount not usually found to lie in the ground between mediocrity and the near great. Such detached, heroic devotion to lofty principle belongs more properly to the high-plane patriotic statesmen class than to the usual run of even the better politicians. Only an occasional big soul, in a crisis, rising above cultivated public prejudice, fashionable political fads, and party restrictions and expedients—in the firm conviction that

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right will become might eventually—could be expected to swallow the bitter pill of retracing wayward steps in an effort to lead public opinion out of the wildness of gross deception.

Would it not, indeed, seem that the open-minded, forward-looking, steady-thinking citizens of all parties should become increasingly convinced that the short-cut to the convalescence of humanity is to be found in frank and open coöperation and world understanding along definite, established lines, in contradistinction to ever-changing outbursts of vague, planless intentions! Such embarrassing intellectual flounderings in fact only reveal, unmistakably, painful envy that "things have already been done" by others, leaving alone available the field of opposition and intrigue, and of wilful fault-finding and tearing down processes for the activities of those whose interests lie in the sweeping and unqualified denouncement and vilification of the character, ability, and accomplishments of leaders having already achieved world recognition as constructive authorities. What the other fellow has done must necessarily be wrong and disdained!

In this connection it would seem that one of the striking exhibitions of the people's easy adaptation and forbearance fitting the topsy-turvydom and "grouch" of the times, is evidenced by the complacency with which they tolerate and even applaud the glaring, misleading discrepancies between the "talk to win" of a candidate for high office and his later "after-election talk" on the higher plane of truthful presentation and fact. The loose statements and equivocations for razzle-dazzle vote-making effect, called by a more offensive but accurate name in Sunday sermons, are cheerfully assimilated, with exciting gusto—satisfying the craze for change, and all "for the good of the cause," of course. Like the salesman who "cracks up" his goods to "put them over," through verbal guarantees in fullest rain-

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bow eloquence that none are as good as his, and with warnings to beware of all others—even so the politician-salesman negotiates his particular political wares, discarding vital facts and distorting others to suit his ambitious personal interests. Disgracefully deplorable as is oftentimes the double or triple rôle of even the superior public man in his bids for leadership of our millions, proclaiming one thing, thinking another, and actually doing a third, all contradictory and stultifying among themselves, he nevertheless pleases more voters than he offends, and "arrives," with plenty of time later on to patch up his blemished character and conscience. But as this system, for the time at least, is America's cute, "free" way of doing things, and since all the world is (or has been) extolling our national virtues, it must necessarily be right, measured by its superficial success. So "at home," too, the folks "conform" (wearing perhaps a sickly smile) so long as "business goes on as usual at the old stand," while the political favorite winks the other eye midst "glad hand, glad word" diversions.

After all, there is small display of fine national character to be proud of in contemplating our soft willingness to be dazzled by vagaries and to "listen in," de facto, at world conferences, to snatch any stray gratis benefits, all without sharing in corresponding responsibilities; drifting along, so to speak, in the current of international affairs, with an indulgently "carried interest" like the "free-riding," sharp-trading promoter exacting largest donations for smallest casual services. Already so long continued, how natural is the obvious feeling growing abroad that our reluctant contributions to the general post-war good, as rich suspicious on-lookers, thus far savor of playing a shabby part of fault-finding obstruction and hedging, with chief concern to shirk responsibilities expressed and implied, while ever continuing as willing devotees of political strife and material gain! For this cramped state of our public mind—

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humiliating in its revelation of apparent narrowness in national character and action, and a blight on American reputation illy comprehended by the world at large—we are indebted in greatest measure to the designing pace-settings of our eager, grasping politicians and to the subtle but influential alien elements of foreign leanings and affiliations, including the corresponding factions abroad of chronic opposition and spleen. Heroes of the hour, "Bitterenders" and "Americanizers," in reality voluble de-Americanizers and envious champions of the little men of narrow vision! Have these political bigots and breeders of the shrunken, hysterical nationalism set the timid pace that kills? Or must their own verdict stand, as being the saviors of the nation from enemies within and without?

In stunning amazement at the ensuing confusion of America's attitude (or inattitude!) toward the great questions of the day, thoughtful statesmen and students of unprejudiced mind the world over are asking:

Just how really big are we, anyhow, over and above the material measurements of mileage, acreage, population, and wealth?

How near are we in reality like what we have been made to appear through our hesitancy, exclusion, and political distortions?

Are the embers of controversy to be rekindled anew, in the ranting and wailing lust for credit through discredit?

Are high standards of the past to become diluted and lowered by the enthronement of mediocrity, now in the ascendency?

Or, assuming that the political asperities are nearly over, have we turned the corner of the mental and moral confusion of the times—with the drift, intellectual and patriotic, making again for high quality, onwards and upwards?

In any event, despite the nation's trials, needlessly

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extended, and despite the victorious jury-bemuddling of the great hopeful public by the envious, ungovernable partizanship of professional politicians, America remains, upon the whole, in the best condition of all the combatants. And in sublime faith that "change for change's sake" will furnish the magical deliverance from a relatively mild participation in the trials of a sore world, to a cleansed state of millennial release from our shackles and bondage, the huge protesting majorities look forward with bland child-like contentment.

It must, however, be conceded, regarding the vital issues and obligations arising from the war, that their controversial degeneration into a confusion of alarming inventions and evasions in the deplorable game of American politics, replete with cheerful prevarications to prejudice the people, though achieving marked political success, has not lessened the general dilemma. Furthermore, recalling the characteristic senatorial dalliance and complexity of motives and the policy of drifting procrastination, disclosed in our rather cumbersome, capricious methods of procedure, it becomes evident that the partizan chill of the higher aims has severely aggravated and unnecessarily retarded the naturally slow world convalescence; besides reflecting universal discredit on our handling of national and international relations in approaching decisions of transcendent importance. Consequently, in our attitude toward inescapable world problems, we are, by many, fast becoming to be regarded as the most self-centered nation in the world, and the least informed on foreign affairs.

Evidently, according to dynamic sociological analysis, *these things just had to happen;* but the echo of it all reveals: the country in great part still suffering from an almost chronic attack of mental confusion and an irreparable loss of moral stamina—substituting, in this ethical let-down, for a normally splendid elevation and

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breadth in ideals and actions, the shrunken outlook inherited from a long term of exciting gossipy detractions —all leaving in their trail the debased tone-quality of a Harvey's "Town Topics" of politics, demoralizing and lowering to public opinion and character.

But since the intellectual humiliation has passed and the harvest has been gathered, so a new set of path-blazers, though pretentious and vague, may "show the way," the patient people are about to be let alone for a while, freed at last from the mentally unbalancing exploitations of political climbers and their news organs. Consequently, obedient to precedent, the public mind and conscience, though somewhat dented, will, it may be assumed, swing back in their own appointed time from roaming far afield in campaign extravaganzas, to their naturally generous balance amid amiable serenity once more restored.

"The trying of faith worketh patience—
Let us run with patience the race set before us."

* * * * * * *

Indeed, in these most modern days, many are the surprising changes in life's standards that would greet, say, an old Rip Van Winkle Freiberger awakening on our shores; perhaps a pessimistic wag of the quaint serio-comic philosophic type, nourished on beer from childhood's earliest happy hour. Ushered into these days of tedious reforms and confronting the twist that has possessed our latest policies and rulings, which inflict upon "free people" (so-called) the tortures of olden martyrdom, his brain-storm would be a subject fit for scientific observation. And one may imagine the strong language in his comments on the strange duplicates and mysterious inconsistencies of our stock eulogies on "The Land of Liberty" and "The New Freedom"—pretensions exploited in patriotic magazines and anniversary celebrations, and all without a smile! Our veteran

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wanderer's meditations would continue along the following strain with rising intonations in his wise outgivings:

"Little wonder that the penetrating innovations of drastic reforms, tainting club and home with chill and liquid intrigue, have perverted all concepts of these most intimate of domestic assets! Or must our new interpretation of Home, Sweet Home acquire added depth as a storage reservoir for booze, while clubs, once by law convivial exchanges, are now clearing houses for sportive sympathy and costly retreats for sobering up the home-made jags!

"Shocking disciplines, where will they end! Not yet or here, for hark: The family doctors, once conservative in principle and of strict decorum, are now importuned to become traveling bars with prescription pads in hand, or forfeit remunerative practice among patients of distinction; drug pests and plants, now flourishing from traffic in corrupting concoctions masquerading under absurd names, have taken on new meaning and recognition; safe deposits and home vaults for watered stocks and precious metals now yield space for more precious booze and rare wines, the new-fashioned temptations of high-class burglars!

"The dreaded submarine torpedo, tame and void of fiendish explosives (since peace that is or isn't!) but filled with standard stock of old, now makes merry cruises on peaceful missions across the border rivers, from kindly shores of sympathetic drinking neighbors. Beloved of 'legislators and enforcers of the act,' these 'strong' connecting links between the friendly nations cheer in holy secret parched throats that breathed reform—which passeth understanding ever more!

"These thrusts at the heart of metropolitan sociabilities are no added balm to withstand the grave strains on the strands of the delicate net of civilization.

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"And now, as finale to the overture of the chanting reformers and that the national presto tempo may suffer no diminuendo, the characteristic flurry is on of repenting at leisure for the sweeping impulsive legislation. Hence the era of chastened efforts at reversal is at hand, with comforting counsel of ablest legal talent to circumvent the law; and while we think and thirst, the vision of things now illegal becoming legal once again provides the new excitement of the hour."

So, living in memories fond, our traveler, too, joins in our childlike submission; and together we suffer "for the cause" with sacrificial resignation and consciences clear as of heroes for the general good, who, in recorded history of the centuries to come, will be looked back upon with pious veneration, as brave New York saints of the classic age of freedom and restriction.

But still at sea as to the justice and wisdom of it all, we turn again, for peace of mind and to forget our thirst and isolation, to the student life of younger days, with its lighter and more entertaining personal recollections. Once more, then, with Hammond's consent, his cheering career of foreign education must be drawn upon for some real enlightenment and refreshing contrasts to the heavy, mournful topics of our present-day trials and tribulations. Recalling vividly his buoyant disposition quickly dispels the musings and tedious lamentations of old age, and compels our yielding, in longing memory at least, to the rejuvenescent fascinations of those quaint old-world times, a half century back, with their inspirational setting of romantic harmonies, and the soothing repose and contentment then seemingly permeating all classes and situations.

Back in those days of youthful aspiration and temperamental effervescence, Jack early showed a predisposition to excel in the domain of romanticism as well. And here it was that a certain captivating cavalier smile,

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PLATE XLII

THE THREE MINING GRACES
(all miners' wives)
Mrs. Victor Clement, Mrs. Fred Corning, Mrs. Jack Hammond

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all his own, stood him in good stead, as a useful equipment for long and close-range feminine exploitation. But this smile, which he was about to capitalize for good and all, also camouflaged a cute, knowing twinkle that forecast merrily clever business whirls to happen in exciting times to come. These early manifestations of talents for preferred capitalization also furnished one more excuse for taking sufficient time off to place himself under the proper affinity-incentive in Dresden for the rapid incubation of these gifts. And so it happened at the close of his academic course that his first really momentous endeavor and irrepressible ambition in life became accomplished facts, for Miss Natalie Harris of Virginia had finally become sufficiently smile-enslaved to agree to the early solemnization of a "for better or for worse" contract. Thereby the daughter of Judge J. W. M. Harris and niece of General Nathaniel Harris, who was then also in Dresden, hopelessly assumed all the risks and hardships of a mining career, doubly compounded by gambling on the personal uncertainties of a mining engineer of then unknown quantity. That this double mining play also turned out well is a matter of common knowledge in "our set."

Jack's Americanism, therefore, ranged high in affairs of the heart. Never for a moment did he become Germanized, diluted or scarred—as far as we knew, of course. It is only common chivalry, however, to admit that his foreign tongue-courting vocabulary was fatally limited, though its quality may have been shrewdly and effectively selected. At all events, he could look the part, but would that have sufficed in a land talkative and eloquent in argument and philosophy? There might have been a call from a Mädchen's court of highest reason for more convincing evidence than mere longing glances, when his predicament would have been grave, indeed. But we may be sure his generous nature would wish any apparent indifference or neglect of local

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charmers to be entirely charged to diffidence and lack of fluency—so let it go at that. Perhaps some day, in tottering old age, he will unfold these secrets, with autobiographic frankness, to his wide circle of admiring but inquisitive friends of old. For, now secure in his long-established independence, he could release a confessional whisper with small risk of jealous attack; besides, it is even claimed big men become the bigger for frank confession of early failures!

So then, assuming a parental tone (but quite painfully, for it goes against the grain of the writer's ambitions for everlasting youth), it must in justice be admitted that "Jackie," thus fondly dubbed by one who knew, was a "good boy," among other things—albeit not in a too Puritan sense; for how could it have been otherwise, when his precious time was all taken up "a-courting"—perforce of tender influences, to be sure? And what envious cynic dare venture the suggestion that in other circumstances Jack might have added to the world's entertainment an eminent career of monumental dissipation! If another good fellow was barely saved for the righteous distinction of mankind, all hail to his alert and attractive fiancée and to the mysterious ways and victories of love, even among hardened, despairing miners!

These reminiscences of Hammond, inspired by recall of a close friendship founded in the long ago, glow with increasing warmth as, in the ransacking of memory, visions of the "old grown young" break through the past now dimmed with years, and materialize once more into living realities of charm and comfort.

To dwell at some length on his part in those Saxon days of hope and vision seems but natural when reviving memories unforgettable of the fond, enduring ties of American student life abroad; and also recalling his leadership in the many varied events and crises typical of his character and the times he then and later passed

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through. For all in all, Hammond's career has been unique in its attractive disclosure of a versatility of tastes and talents backed by motor forces of enterprise and initiative. Hence who could better serve as a central figure for reveries of a Freiberg past? This apparent partiality does not, of course, imply that there were no other talented men and good fellows of our time to whom much of interest attaches. But all could not lead in the investment finance of mining engineering; and if some one had to bear the honorable burden of professional prominence or the exhilaration of being in the public eye with all its attendant responsibilities, as one may choose to view it, why not Hammond?

The following chronological record of Hammond's career, among similar activities of many other Freibergers, illustrates the wide range of the calling of the modern mining engineer.

1880:

Special Expert of the U. S. Geological Survey, in the examination of mines in California.

1883–1884:

Mexico; Manager of the Minas Nuevas, Alamos, Sonora.

1884–1893:

Examined and promoted the famous North Star Gold Mine, of Grass Valley, California, later becoming Manager and Consulting Engineer of the Company, and also Consulting Engineer of the Empire Gold Mining Company, in the same District.

Consulting Engineer, Union Iron Works, San Francisco, Cal.

Engaged as Expert in mining litigation.

Consulting Engineer, State Mining Bureau, California.

Mining Engineer, Central & Southern Pacific Railways.

Consulting Engineer and President, Bunker Hill & Sullivan Mining & Concentrating Company.

Examinations in the United States, Mexico, Central and South America.

1893–1900:

Consulting Engineer: Consolidated Gold Fields of South Africa; British South African Company; Randfontein

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Estate Gold Mining Company; May Consolidated Gold Mining Company; Reitfontein Estate Gold Mining Company.

Consulting Engineer: Barnato Brothers, Transvaal, South Africa.

Recommended, organized and directed the development of the "Deep Levels" of the Rand.

Drew up the mining laws for the development of the mines of Rhodesia, South Africa.

Rhodesian territory was opened up in 1895 on Hammond's recommendation. This is the region of the historic mines of King Solomon. These mines had been worked, during a long period, to depths of less than sixty feet at the time of Hammond's examination. They had been abandoned for many centuries. Some of these ancient, widely distributed surface workings have been reopened and are operating to-day at depths of two thousand feet. The gold output of Rhodesia is now about seventeen to eighteen millions of dollars per annum, equal to present production of California.

Purchased with H. A. Butters, and electrified and extended the horse tramways of the Cape Electric Tramways, Capetown, South Africa.

Purchased with H. A. Butters, and electrified and extended the horse tramways of Mexico City.

Purchased with H. A. Butters, and electrified and extended the steam trams of Geneva, Switzerland.

Developed the Mt. Whitney Power Company, California.

1900–1907:

Consulting Engineer, El Oro Gold Mining Company, Mexico.

Consulting Engineer, The Stratton Independence Company of Colorado.

Promoted the construction and development of the Guanajuato Power & Electric Company in Mexico.

Purchased for the Venture Corporation of London the Camp Bird Gold Mining Company of Colorado. Consulting Engineer of that Company during this period.

Purchased for the Guggenheim Exploration Company and the Venture Corporation the Esperanza Gold Mine of Mexico, one of the great gold mining successes of the Republic.

Consulting Engineer, Tonopah Mining Company of Nevada.

Consulting Engineer, Guggenheim Exploration Company; assisted in the development of the Utah Copper Company,

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Nevada Consolidated Copper Company, and several properties in the Federal Lead District of Missouri, and properties in Mexico.

1908–1920:

Made examinations of the mineral and other resources of Russia, for the Russian Government.

Recommended and became interested in the purchase and development of the Yuba Consolidated Gold Fields of California, the foremost paying gold dredging enterprise in the world.

Reported upon and recommended the Santa Gertrudis Mine at Pachuca, Mexico, among the great silver producers of the Republic.

Organized, purchased and developed the International Petroleum Company (Mexican Seaboard Oil Company) of Mexico.

Organized, purchased and developed the Yaqui Delta Land & Water Company, Sonora, Mexico.

Purchased iron mines in Brazil, South America.

And now returning to Dresden, only an hour from Freiberg; this lovely capital with its art, music, and attractive foreign colony was in reality a refreshing oasis of inspiring charm and resource for the comforting resuscitation of the rusty and frequently demoralized Freibergers. For, after all is said, homesickness often made the mining capital appear sadly rugged and crude, high-sounding perhaps in poetry, but suffering by contrast with even the prose of sweet Dresden and its fair visitors in the foreign colony. In the raw, misty winter-time, a mournful, morose tone would possess the old academy town, which was accentuated by the ancient spectral shafts scattered through the city, whose automatic tolling bells signaled in the black night to the watch above and to the home-bound student that the pumps were running and all was well below.

So it will be readily understood that Freiberg could become painfully monotonous without our periodic visits to beautiful Dresden, close at hand, with its many pretty American and English girls there assimilating the stored culture of the ages, and always ready to dispense

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their most favored consideration to the properly accredited Freibergers, who were regarded as the coming supermen in those days of simple vision, faith, and student ideals.

Those pilgrimages to the Saxon capital where the American and English boys went in groups (shall we say for reorganization of æsthetic and moral standards among other things?) formed a very dominating and agreeable feature of our foreign sojourn. With all of German thoroughness, however, there was no course of lectures at the Academy covering these particular cultural expeditions, so we were thrown solely upon our own resources and wits, to return to our mountain home whole and solvent from these sociological and gastronomical reconnoiters of lively gait in the hotels, operas, theaters, the American Club, and dance-halls of this loveliest of art centers.

The depressing "Katzenjammer," or next day reaction, from these progressive round-ups, recalls that among Freiberg's sins it had the reputation of being a "fast, dissipated" place, terrorizing terms of the once strict old Puritan régime; and there is no denying that it had a strong human side among the many charms of its character make-up.

Fully apprehending these youthful pitfalls, many a parental admonition must still be echoing in the students' memories of the fond good-bys and letters from home. But Freiberg had a stupendous reputation to sustain for completeness in education which it could ill afford to risk by any form of narrowness or neglect. So if demand arose for the complete unfolding of life's panorama, there was, let it be admitted, latent talent in this direction as well. At all times, however, a preponderance of serious inducements and legitimate attractions was in evidence to stabilize evil forces and safeguard the student morale in the quest of the solid things.

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Indeed, if the kaleidoscopic shifts in worldly affairs, good and bad alike, must sooner or later be forced upon the vision of rising, inquiring youth, why not have these character tests and medicinal experiences worked out amid the sugar-coated and sobering incentives of a Freiberg setting? Perhaps, after all, then, our indebtedness to foreign education of old was increased by this bonus culture in Bohemian romance and revelry—the liberalism of the modern day making for symphonic development and happy balance of faculties so well and ably pioneered by Freiberg's gentle pace.

* * * * * * *

Life abroad is full of multiple charm in its choice cultural and historical atmosphere and attractive class distinctions, the heritage of the centuries. And in the freedom from restraint and the narrowing conventionalities of localism and rigid formalism among visiting Americans, a wide sweep is afforded them for the versatile cultivation and exercise of the imaginative faculties in their pursuit of accomplishments.

To young Americans, in particular, early bred in the cruder, or at any rate, the less finished, new-country surroundings, even now as in the old days Europe makes irresistibly fascinating appeal with its unending captivating novelties and opportunities always engaging and upbuilding in refinement, learning, and beauty.

Enveloped in picturesque setting of ever-changing scenery, people and language, during the youthful period of maturing tastes and ripening susceptibilities, the temperamental responsiveness and spontaneity of both sexes are kindled into warmest sympathetic activity. *En rapport* with these, in the times now passing, were the enchanting simplicities, the genuineness, the defined yet flexible social order and the reverence for achievements and authority common to the older countries where fun-

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damentals became ennobled through the sacred precedents of antiquity.

Together these conditions added refreshing exhilaration to the broad substantiality of European travel and study, since they made for the ideal awakening of natural talent and temperament on the high plane of intellectual and artistic interests, and for the rapid welding among an American colony of the bonds of friendship and genial understanding in social relations. Then it is that humans are at their best in personal attractiveness; and through a certain pleasurable loneliness of isolation far from home, feelings of interdependence and sentimentality spring up among our fellow countrymen thus thrown together in strange lands, mellowing and heart warming, especially among the young people.

Dresden, with a population of two hundred thousand, of Slavic origin, dating back to the twelfth century, had in course of time become one of the most popular and sought capitals in all Europe as an attractive educational center offering a diversity of rare advantages in painting, sculpture, music and drama connected with institutions of learning both classical and technical. As Saxony's proud kingly city of world-wide fame situated in a charming valley on both sides of the Elbe river, but primarily on account of its fine architecture and splendid art collections, it was by common consent early proclaimed the "Florence of Germany." The two bridges (1727 and 1846) connecting the Old Town and New Town sections are chefs-d'œuvre in beauty of construction.

An entire section—the English Quarter—was occupied by the American and English colonies with a sprinkling of Russians and other foreigners in lesser numbers. Here also was centrally located the American Club in the Victoriastrasse—a transported bit of real New York in its most sparkling days of liquid sociability, but with a longer list of choice old-world wines and a touch of in-

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ternationalism in its social fabric not so prevalent back home. Mr. George Griswold of New York was at this time President of the Club and Seymour Van Nostrand was Secretary; and there were fully one thousand Americans residing in and around the city, among others Julian Hawthorne, son of the author of "The Scarlet Letter," "The Marble Faun," etc. These were attractive days of distinction in Dresden's American social history. Among many prominent individuals and families who through the charm of their culture, high social position, handsome children, and *chic* added prestige to our foreign colony, were: Mr. and Mrs. Joseph Bramwell of New York, with their three daughters and four sons; the David Leavitts of New York, most of whose children married into distinguished Saxon families; the Sargent family of Boston; Mrs. John Palmer, whose daughter is now the wife of Chauncey Depew; Mr. and Mrs. Schuyler Van Rensselaer of New York (Harvard 1867); the Learned family of Pittsfield, Massachusetts; the May family of New York, one of whose two daughters, Edith, married William C. Whitney of New York; Edward Winslow and James N. Winslow, sons of James Winslow of Winslow, Lanier & Co., bankers, New York; Governor Lawrence and family, of Rhode Island; Dr. Watson of New York; Frank Gray Griswold, New York; the Ives family of Hartford, with two beautiful daughters; Thomas A. Biddle and family of Philadelphia; George Cammann, New York; and Rev. and Mrs. James Leonard Corning and family, New York; Prof. William Dwight Whitney, the great philologist of Yale; Mrs. Hadley and her son, Arthur T. Hadley, now President of Yale University.

The Americanization of the staid people of settled habits in continental Europe was proceeding with such strides at this period that their enthusiasm was awakened for the base-ball craze; and the English editions of Paris, Geneva and Dresden papers were featuring the

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scores of Freiberg-Dresden matches with fullest particulars, while the German papers, with manifest conservative condescension, declared, "the game may perhaps have some merit as exercise for our young people."

Freibergers periodically congregated in the American Club, a center of joyous exchanges, with touching fidelity to the best club traditions. They were, in fact, conceded to be privileged contributors of student live-wire convivialities to this otherwise often dignified and composedly-inclined gathering. So when these youthful gold-diggers of science swooped down on Dresden town from their mountain mining home, it was in the air that "things were bound to happen," for their intensive presence was soon felt through all grades and shades of Dresden's social world during the twenty-four hours of each day of these visitations.

But like spirited animals Freibergers, too, could be subdued and tamed. Hence, strange as it may seem, an occasional one besides Hammond had lucid moments of repentance and moral aspiration; and, as is apt to be during such tragic reactionary impulses, in order to sustain the reform movement, the superfineness of inspiriting femininity, with its steadying influences, became injected into the miners' social landscape.

Mr. Freiberger then with the vision of halcyon days ahead chose to concentrate considerably more than his spare time and usual attentions on Miss Dresden, impetuously but sagaciously selected, thus robbing "the boys" and his Club, not to mention the Academy, of many hours of his progressive society to which they had hitherto enjoyed prior claim.

Of course *she* had abundance of natural charm, good looks and budding talents, all of which had evidently been advantageously invested at European compound interest, figuratively speaking, since leaving Fifth Avenue for a finishing course abroad. To a former rather colorless girlish simplicity slightly insipid and suggest-

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ing monotonous conventionality, with magnetic quality as yet in latent form, there had been added, greatly to her credit, the forceful attraction and bearing springing from ripe education and expanded outlook; while her "pretty" type of face so characteristic of dainty American girls, seemed hourly evolving into the more enduring and expressive "handsome" kind of statuesque beauty likely to endure far into the middle years of life —a transition favored by maturing character amid improving environment. She had enjoyed the usual governess, linguistic hot-house plant training of a New York girl of quality and means, and had already proved at home her superior mental raw material, needing henceforth only the wider opportunity for moulding this natural capacity into the finished product.

To this end Europe and the mining engineer were in collusive partnership; and the process was proceeding in orderly fashion with much promise. In short, the pretty pupil was effectually evening up on Nature's constant tendency to distribute more gifts of beauty than of intellect. But all the while he was asking himself whether young ladies may ever enjoy the wider-range advantages of tutors instead of governesses, to nurture their latent intellectual talents and temperamental gifts into mature ripeness and fullest blossom; or, for ultra-refinement's sake must their entire cultural development be confided to old maids, ambitious suitors, exciting novels, progressive free-love plays and chaperoned summers!

At first a casual observer, our prospective affinity soon became a willing-to-be-convinced devotee of the Freiberg type of aggressive and progressive world-youth. In reality each looked better to the other than might have appeared in New York not long before; for here in new uplifting surroundings and so far from home, the young people had gained a sort of plussage in attraction and consequence, absorbed in large measure from their

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mental expansion and mutual interests, and the favorable setting of European sojourn.

So it came to pass that the unknown x quantity in the Freiberg-Dresden courtship equation, of ever-growing speculative interest to the foreign colony, was regarded as promising of happy determination under the atmospheric and æsthetic conditions prevailing in these elysian Saxon fields; and in all probability with more rapidity and enduring effect than back on Fifth Avenue of old.

Being a common-sense student of human nature, at least in an amateur way, as well as of the material world professionally, the man in the case concluded with characteristic male cunning that courtships could be most favorably pursued amid entrancing surroundings; and therefore it was his part to create entertaining conditions and situations agreeable and gently appealing to his highly organized companion of delicately sensitive and perhaps apprehensive nature.

No jarring disturbances, physical or mental, should be allowed rude intrusion, such as the heavy-weather strains of arguments on Nature's secrets of science and religion or other confusing profundities, except in so far as abstruse notions might by suggestion steal through the air of mysticism from on high, along the fairy paths of the divine rights of kings! But rather with pleasurable diversions from the sterner problems and responsibilities of life, and protection against their depressing phases, would he endow the firm of Cupid & Company. Besides, Dresden's treasures and beauties would speak for themselves or be ever present as his faithful partners in silent appeal. Thoughtfully contributing helpful service in a devoted but simple way would go far, for the time being, toward the establishment of sympathetic accord and in planting the seeds of her growing dependence upon and perfect confidence in the manly yet wily courter.

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The engineer's intuitions along these admittedly involved metaphysical lines, manifest in the mysterious ways of life and ladies, seemed even to him almost miraculous, though a bit uncanny. And whether merited or not, the lady in the case also felt what seemed to her, following the then tendencies to male favoritism, a certain superior yet tender power and wise guidance on the part of her far-seeing companion. Both may well have sensed at this stage that the "Academy" was doing pretty well—and all without the ripe experience of a veteran, or the aid of a supporting Mephisto! But from the *first* they had liked one another anyhow, conformably to the laws that do govern the "crumbs of Heaven on earth," so the observance of complicated academic formulæ of conquest after all was of small moment.

As genial drifters in the alluring social currents of Dresden life, our light-hearted young couple had joined in the dancing parties of the simple old-fashioned merry-making kind among the American and English residents; and they had also been in evidence at the larger seasonal balls in the Grand Union Hotel and at the spacious residences of the titled families, which were brilliant affairs in their official and military attendance from all parts of the empire. But the crowning event of the winter's activities was being presented at court to the Saxon king and queen at one of the royal functions —a stiff ceremonial of much consequence and pomp, but always of keenest interest to the womenfolks. The court entrée could only be obtained through the guarantee of social credentials and an introduction by the American Minister at Berlin; or, as an alternative, through some high official in the local court circle.

For some years during this period J. Arthur Bramwell (now of the Union Club), the accomplished son of the prominent New York family then in Dresden, was a student at the Polytechnic and enjoyed the social leadership of our young colony, and in court circles as well,

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though then barely out of his teens. He and his family were favorites of the distinguished Minister of War, General von Fabrice, whose palatial residence was the society rendezvous not only of the élite of Dresden but likewise of the visiting nobility from Berlin and other capitals in the empire.

In general, the Saxons of those days were a kindly, easy-going, cheerful Protestant people under a Catholic king and court, and they reflected the influence of a long line of jovial monarchs and princes from Augustus the Strong down. The social relations between the people and the foreigners were also extremely cordial in those long treasured years of the dear past.

The fleeting society features of a Dresden winter, however, were soon exhausted; for, after all, the capital was not large in a London-Paris sense. And, save for the novelty of a "look-in" at court on a real "Royal Flush," the other sociabilities could readily be duplicated elsewhere. But the situation was quite different respecting Dresden's more permanent attractions, for these were realities of singular importance and value, unique in their inexhaustible charm and instructiveness.

To the credit of our roaming engineer and his devoted partner, they invariably reverted to these enduring things, fully realizing in the excellence of their judgment that Dresden's gallery treasures, the accumulations of long centuries, would not always be available to them. There was ever, as it seemed, a bewildering lot of real old-world sight-seeing to be completed, the chief places of interest being: the Zwinger, begun in 1711, with its many rare antiquarian and scientific collections, adorned by statues of Michelangelo, Raphael, Giotto, Dante, Goethe, and others; the Royal Palace, rebuilt in 1534 with masterpieces of Rembrandt, Guido Reni, Poussin, and Caracci; the Prince's Palace (1715), with Torelli's works and a library of twenty thousand volumes; the Brühl Palace, the Belvedere and Terrace

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(1737), built by the Minister of Augustus II—a favorite promenade and concert hall commanding a sweeping view of the Elbe River country far down toward the mountains of Saxon Switzerland, some fifteen miles distant; the Japanese Palace, containing a public library of over three hundred thousand volumes; the Johnneum Museum, containing china collections of Meissen, Chinese, Japanese, East Indian and Sèvres specimens; the Grosser Garten, with its fine winter skating, and a summer theater, two museums and Zoölogical Gardens; the Churches of Our Lady (1726), St. Sophia, the Cross Church, the Russian, English and American churches; and the Roman Catholic Court Cathedral (1737–56), celebrated for its great Silbermann organ and wonderful music by a vested choir of boys. Then there was always inviting: the Royal Court Opera, second to none in Europe architecturally and in the splendor of its performances; the Green Vault of the Royal Palace, with an unequalled collection of precious stones and works of art in amber, ivory, silver and gold, in all over three thousand specimens, adjoining a Gallery of Arms containing two thousand weapons. And, finally, greatest of all Saxon assets, the famous Dresden Picture Gallery founded by Augustus I and containing over two thousand five hundred pictures, foremost among the world's adorable art treasures of priceless value. A collection of over 350,000 engravings and drawings filled many adjoining rooms of the Museum and were classified according to the great epochs in the history of art.

In the Gallery, preserved under jealous guard, are many of the choicest masterpieces of all time, belonging to the Italian, Dutch, Flemish and French schools: the works of Raphael, Titian, Correggio, Leonardo da Vinci, Paolo Veronese, Andrea del Sarto, Giulio Romano, Annibale Caracci, Guido Reni and Carlo Dolci being among the Italians; and Rubens, Van Dyck, Rembrandt, Ruysdael, Wouverman, Dow, Teniers, etc., among the Flemish

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and Dutch; while Poussin and Claude are represented in the French department.

In a room apart, in lonely sacred splendor, hangs

Raphael Sanzio's Madonna di San Sisto,

immortal names that have echoed around the world and raised Florence, Rome and Dresden to a pitch of artistic celebrity, and inspired for all time the better thoughts and aspirations of the human race.

In 1734 this greatest of all masterpieces was sold for about one hundred thousand francs by the Monks of St. Sixtus to Augustus III, Elector of Saxony and King of Poland, who placed it upon his throne in Dresden with the command, "Make room for the great Raphael." Whole libraries have since been written by distinguished critics and litterateurs on this transcendent creation, which embodies the highest evolution of exalted genius in religious art. Well has it been said that a divine note runs through the sublime harmony of the painting in the Virgin's wondrous eyes of infinite softness, and of the Child in arms, as they look down the vista of the ages.

Lost to memories of earth in the glorified moments before this inspiring vision, as are highly organized responsive natures, the contemplation becomes the more impressive through the devotional cathedral hush and sanctified air of meditation that pervade this Holy of Holies art chamber. Here, in the sublime aura-radiance and uplifting spirit of the Great Raphael's greatest work, might well have been written the grand inspirational hymn, "Nearer, My God, to Thee!"

Still, our young American couple, though also wrapped in awe, were in spirit and ambition essentially of this "world-below," and they frankly avowed that only a cultivated, acquired taste could justly appreciate all of the picture's subtle merits; but, always in good form, they prudently reinforced any waning beatific attitude on their part with the best of guide-book behavior,

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for they too had "read up" in advance and become appropriately saturated with religious meditations and sacred art thrills! For a mining engineer of many divided interests, the American student also was absorbingly impressed, although enjoying but slight intimacy with the mighty masters of the past. In truth, to him real marriages and nurseries seemed, for the moment at least, almost in the class of vulgarized formalities and burdensome charges, in the presence of these immaculate visions of Mother and Child and saints and angels, all floating in heavenly space. Verily, the loose, ragged ends of his early religious training under these benign, stirring influences were being hopefully patched up and restored like the perforated canvases of old masters, as with mixed feelings he alternately beheld the Raphael Virgin face of eternal grace and celestial beauty dominant in the realm of faith and hope, and the gentle girlish face of sweetest suggestion, his own choice among the tangible living. But, fearful lest he become over-afflicted with penitential remorse and reveal perchance through confessional impulse a naughty-man side of erring student years, he must at all hazards "start something" to break the deadly silence of the pious spell, or risk the loss, perhaps forever, of her tender regard and approving gaze which had come to be the controlling balance in his drifting life.

The girl, however, seemed more genuinely absorbed in this chapel of picture worship and consequently more at her ease than her mining engineer friend. Having infinitely further to go than she in the reform movement now in progress, to retrace and purify the past, quite naturally *he* felt more severely the reactionary temperamental depression from the double strain of reformatory momentum and hopeful exhilaration. Manlike, he had already learned to lean upon this devoted girl companion, consoled in the thought that religion and morals are more in woman's safe keeping as

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the better constituted for such trust; and so again he looked supplicatingly to her as a saving tonic to swing him back to "normalcy" (our cure-all term of the present day) from the depressing dreariness of pondering on life's shortcomings and hopeless secrets. And although the fair girl, for the moment so saintly, was still in spiritual concentration and appeared to be convulsively fumbling for her absent prayer book to complete the devotional symmetry of the scene, she was yet sufficiently of this world to feel sympathy for her partner's restless yearning for a releasing call back to life and action.

It being painfully evident that he had long been on his good church-behavior (which of course came harder to him than to her), and as both were at last alone as a young American honor-watch in the hallowed art sepulchre of the world's translated Great of bygone centuries, both felt more comfortably at ease. Resuming his mundane musings and by way of good cheer to break the deadly monotony of silent devotion, the future mining expert observed to his responsive partner of keen intuitive understanding that perhaps there were too many infants in the picture for a vision of pure heavenly domesticity, where those things didn't happen quite so often. And as it now seemed appropriate to the theme to move on out again into the world of material things, while the lady gathered her thoughts and found her bearings, together they bade farewell to the Great Gallery, perhaps for the last time. Making their way toward the Grand Opera House to secure a box for that evening's gala performance of "Faust," as that day they were doing up Magdalenes as well as Madonnas, she reassuringly pointed out to the youth of mining science that of the three children, two at the bottom of the picture, about to be stepped on by the advancing Heavenly Host, millions strong, were surely removed from every earthly cradle class, for they had incipient wings, the

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MARION ADELINE VERNON CORNING

PLATE XLIII

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FREDERICK GLEASON CORNING, E. M., LL. D.
(FREIBERG 1875-1879)

WHOSE FATHER, REV. JAMES LEONARD CORNING, SENT HIM TO THE ROYAL MINING ACADEMY ON THE RECOMMENDATION OF HORACE GREELEY, WHO FORESAW THE GREAT FUTURE OF MINING ENGINEERING IN THE UNITED STATES.

PLATE XLIV

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real trade-marks of real angels and not necessarily the human insignia of aëronauts, athletes, and bicyclists.

Anyhow, regardless of all youthful American efforts at the higher criticism, both agreed the Raphael picture must be the biggest thing in the world, there was so much fuss made about it; and because everybody said so, and majorities always counted and settled things back home. Thus moralizing, the young couple progressed (or retrogressed) back to real life, away from the gloom of artistic and erudite righteousness. Barely out of their teens with youthful energy at its best, of course their judgment on profound subjects was as yet immature; nor could they for long infuse a funereal solemnity into the gravest themes and sights, preferring in these budding years which could never return again to let Nature have her fling in the domain of good cheer and humor.

And as they breathed long and deep in the refreshing air of the outside world of vitalizing expansion, the ascetic pallor of their spiritual "communion with saints" made way for the returning high color of exuberant youth with its perfect blood circulation and bounding optimism. So, again they could look absorbingly upon one another, drifting along in the world's currents with all their possibilities of living, longing, and loving.

From any point of view it had been a great red-letter day in their expanding harmonic lives; and to the engineer the American girl looked more than ever magnetically beautiful in face and form for the contrasting reveries and conflicting emotions of the day; while he remained convinced that, on the whole, for steady diet and every-day purposes while still in the flesh, life with her outside of the gallery was more wholesome and within the range of his finite understanding and appetites.

Accordingly, that evening, early before the Grand Opera, they dined in the Belvedere pavilion of the Brühl Terrace at sunset on the banks of the Elbe—a favorite,

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poetic resort of the people, rich in lovely scenic setting and historical associations. The best of cheering orchestral music, German cooking, and a tempting assortment of native and French wines completed the satisfying ensemble and menu.

This restful terrace with Dresden's ever-present art adornments was especially popular with the Americans' parties *en famille.* As a refuge abounding in old-country Bohemian life with its sterling simplicities, rational entertainments and "real values," it had taken firm hold on our young life-loving couple; and, indeed, they often wondered what could replace these merger-with-nature outings when the time should arrive to return to America.

Strauss's music was then all the rage from Vienna to Berlin, Dresden and Munich, in fact throughout Europe for that matter; and the light operas were in full swing at the smaller theaters in Dresden and other cities.

In the Grand Opera world intense rivalry had sprung up between all of the capitals; but Dresden's exquisite New Court Opera House, with immense seating capacity, was leading in the fame of its grandiose performances. Richard Wagner's works, too, had finally come into their own after long-drawn-out controversial strife and division among the composers and critics of the day. The treasured experience is still fresh in the writer's memory, shortly before these events, of being present at an operatic festival in the Royal Theater in Stuttgart, when the great Wagner, then a visitor, was leading as the commanding composer of the modern school.

The audiences in those far back times, although of international make-up, were simple in dress and appearance compared to the jewelled display, the smart styles and elegancies of much later years, and in which, as quasi-social functions, the Metropolitan Opera House of New York now excels in world leadership. But then, the Saxon capital made its own particular contribution

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in this line from among the spangled, decorated members of the diplomatic corps and the trim, well-dressed officers who on the whole were a handsome, fine-looking set of men. They formed a sparkling fringe around the audience, particularly in the very first rows, where the officers, between the acts, were privileged to stand up and face about to "rubber-neck" the ladies with monocles and field glasses—and thus incidentally keep the military pomp and royal power constantly in evidence before the obeisant people. Apparently the admiring, docile German women, always impressed with bright buttons and bluff, were then quite content to have their men carry all the style and glitter usually relegated to the fair sex, so-called.

The "Faust" performance was the usual grand affair. The masterful music of Charles François Gounod (born at Paris June 17, 1818, and died there October 18, 1893), intertwined with the first part of Goethe's greatest drama, is a human opera-creation of surpassing beauty and picturesque profundity. Always of stirring interest, the fascinating work is an awakening revelation of the forceful union of Germany's splendid robust literary and dramatic genius with the grace and appealing refinement of the touching, dainty music of gay France.

In a class by itself, "Faust's" outstanding distinction in the world of art will ever endure as a remarkable union of the two greatest cultural forces of the two foremost European continental countries. Its rich, melodious harmonies of deeply religious undertone, the fascinating artistic setting and powerful portrayal of the whole gamut of life in philosophy, love, religion, and demonology are unequalled in classic yet human resource.

The mighty work impressed the young people as not altogether discordant with the collective character and sweep of the great gallery, with its Madonnas, Magdalenes, and historic art and genre subjects. Indeed, the

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thrillingly romantic opera paralleled, in a way, the fluctuating sensations felt by both earlier in the day, as they traversed the long labyrinths of pictures in the famous museum with its continuous panorama of the world's varying events and conditions and of the ideals of mind and heart, wending down through the centuries, all ending with their benediction, as it were, in the Raphael chamber.

Although presumably an underground man by training, the engineer showed much familiarity with the tragic phases and underlying thoughts of the stupendous Goethe-Gounod creation, which deals with things on the surface of the earth and in the heavens above except when, as a mining engineer accustomed to temperatures, the devil goes below occasionally to replenish his resources and again take a fresh hold on earth.

But the student was disposed to allow *Mephistopheles* a "better deal" than the verdict of conventional ethics; for, to his liberal way of thinking, in modern society and a busy world where "time is the essence of the contract," *Mephisto* is in reality the useful short-cut middleman to many loves and, therefore, an expert exponent of the higher economics! And he thought perhaps in the dim past his subterranean majesty, besides having held the keys to the deep secrets of plutonic mine geology, had beyond doubt been the resourceful originator of all modern matrimonial agencies and love bureaus with their tempting beauty parlor adjuncts! At any rate, he concluded, the Goethe kind of demon is a useful person entitled to some credit at least for keeping things going, especially in high society; and he surely merits less of denunciation considering the legions of his distinguished, virtuous patrons of both sexes, besides the innumerable delicious festivities over which he presided with all-enchanting grace.

Assimilating in instalments the engineer's lucid vaudeville moralizings discreetly sugar-coated with

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apologetic expoundings, the enlightened and elated girl was becoming agreeably convinced that a Freiberg M.E. must be difficult if not impossible of duplication. For, in scope of erudition and spirited flights of originality, he contributed in fullest measure to her social and mental entertainment, and not unlikely to her general educational improvement as well. But now and again her Freiberg "child of science," as the girl liked to call this particular engineer, was warned not to pose as "knowing it all," just because of having attended a few half-understood mining lectures, intermittently at that, although she felt much guilty responsibility for the many serious diversions of his time and studies at the Academy.

In the foyer, between the acts, the attractive American belle of much style and means (as translated in terms of the simple German girl standards) was surrounded by a buzzing crowd of American Freibergers and their foreign friends, swell officers of heroic looks and decorations, and newly arrived English and Americans in the Dresden colony.

Characteristic of seasonal beauties, this one was no exception in her relish for being the center of an admiring throng; for even the loveliest of women enjoy the play of half-way optioning unto themselves, by look and deed, more than one anxious candidate for favors. In these general social moments the engineer found to his alarm that his monopolizing influence over his companion became utterly suspended, judged by outward appearances, and he was left to float about in some wonderment at the sudden transition, and as to just how far he had in reality created a dominant situation.

The good angel of intuition now whispered to him that the time was about ripe to bring on some new startling crisis to whip up his companion's interest and admiration. And this plan involved the emulation of, if not some radical improvement upon, the Goethe scheme,

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by himself turning *Mephisto* and disappearing underground; but in any event the adventure should not be undertaken alone if he could help it, for he would further Americanize the drama by insistence on the heroine going along. This meant, of course, a trip to the Freiberg mines, which were the nearest approach within the student's reach to the *Mephisto* world of mystery and magic.

Returning from the opera in a dilapidated Dresden "droschke" of the horse days of conservative pace, the usual fussings and lover-like rebukes ensued because of the young girl's tolerating so many officers hanging around, which under strict foreign etiquette might be construed as encouragement! These world questions finally settled by compromise, there followed the more animated academic debates on the reality of devils and the many subdivisions of the genus versus the social hypocrisies of strict conventional European ethics, especially on the proprieties of kissing, which latter subject, however, was taken up along purely theoretical lines—on this particular occasion—although the driver, well bred by Freibergers, looked steadily ahead. Apparently, however, the Academy was highly informed on these planet-moving themes; but to the student's chagrin, the time had evidently not arrived for the more cyclonic activities in the domain of romanticism, at least not to any alarming extent, so there was no panic among the Dresden police force that night.

In his dismal reflections it seemed clear that Americans may not enjoy the advantage of being infectiously susceptible and temperamental in the foreign impressionable sense of noisy, tragic explosiveness. But there was, nevertheless, some consolation in the thought that perhaps they have a more even, frank, and high-bred control in love affairs than Europeans, which, in the long run, may the better endure as of color more fixed than fading; and to his analytical view it further seemed as

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though the simpler outward forms of the gentle passion, characteristic of our newer country, might be the diluted though still provincial inheritance of the ritualistic Sunday-school-picnic habit of mind of our early rural Puritan society incurably tainted with restraining blue laws and ever mournful outlook!

After composing some differences in these delicate fields of speculative romance, and mutually exchanged persuasions and cautious deliberations regarding out-of-town excursions together, the young lady consented to the mining trip, only an hour out by rail, and the *partie à deux* was arranged. Hence once more optimism reigned supreme, and all was well with the engineer and his foreign course of study.

The run to Freiberg was made *à grande vitesse,* if not in railroad time, then in emotional velocity, seemingly a quarter of an hour for the trip. To the young couple, quite willing to be alone, the isolation and safe exclusiveness of being locked in a *Koupee erster Klasse* of the olden type cars, usually occupied only by royalty or *nouveaux riches,* made for cozy familiarity, soothing yet exhilarating—an eminently satisfying situation of novel, exciting charm all its own.

Having been dominant in each other's thoughts night and day during months of pleasurable social and sight-seeing events of closest mutual interest, they were at last making a new record in their earthly careers, in thus being tucked away in complete independence of the outside world, yet in growing dependence upon each other in sweetest nestling companionship.

In the rapid gliding travel of luxurious cars above and beyond the roughness of daily life through fleeting landscapes of gracefully rolling topography, picturesquely dotted with groups of happy peasants, floral fields and peaceful villages, there arises a pleasing consciousness of personal power, combined with a vibratory stimulation yet soothing massage of the nervous system, all

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agreeably enlivening to the imaginative faculties without reaction or strain—when seated beside the right person.

What went on in that otherwise uninhabited coupé was chiefly of *sotto voce* soul language, or thought transference—unexpressed in current human tongues; but all the way, the fate-psychological-laboratory of the higher powers was working overtime in building irresistible, natural conditions for the mysterious finishing touches of falling in love. And as the train approached the Freiberg station and the wonderful first travel together was abruptly ending, a startling premonition with strangest emotional elation, never before felt, suddenly possessed the young girl: could it be that she had been traveling with her future husband unawares?

At Freiberg it was an event of absorbing interest to have a captivating young girl visitor from the Dresden society colony, importing style and quality foreign to the old mining citadel. Her enlivening presence in the quaint narrow streets and historic market squares was appreciatingly noticed and quickly noised about with cheering excitement akin to a new strike in the famous mines; and her student guide as well became the benefactor and conquering hero of the hour, quite the envy of the students for his good fortune outside if not inside of the Bergakademie.

To this young girl there was much of mysterious fascination about the college career of the student in whom she had become interested; and drawn by a strange new force of devotion almost tender, her enthusiasm was running high to see the queer old medieval house where his rooms were located and from which so many urgent letters had been dispatched to her; and to come in close contact with all of the things and scenes intimately associated with his life and ambitions at the institution.

Accordingly, at her request and before going to the mines, a swing through the town was decided upon, to

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learn how far away he lived from the shafts, the various buildings and laboratories, the Anglo-American Club, and Hotel de Saxe where the American students congregated; and in no event should she miss the age-old Dom enclosing the grand ornate tombs, tarnished and stained by the damp of centuries, of Freiberg's earliest Mining Princes who in the dim past were the royal makers of mines as well as of kings, and whose descendants, many generations later, with the knighted men of science, founded the famous Academy.

Never had she expected to develop so deep an interest in these strange things in such severe contrast to her early surroundings and bringing up. But her secret surprise was no greater than the student's elation at the evidently sincere almost fellow-student interest of the young girl. Both lingered about the old original Academy building, then well over one hundred years old, where the engineer, when not with her in Dresden, was working but chiefly planning his next trip to her side—for as boys go he was not a type of the burner-of-the-midnight-oil student prodigy. Though the structure was forbiddingly plain, musty, and dingy with time, all else seemed to the society girl beside the object of the trip. A sort of filial attachment was springing up in her heart for this humble spot, so famous in historical associations and for its early pioneer-scientists and their brilliant American mining engineer disciples.

Examinations for degrees were just then in progress at the close of courses of study ranging from three to four and sometimes five years. The young Americans watched for a while the anxious candidates going before the faculty in groups not exceeding two or three at a time in old, floppy, weather-beaten dress suits, presumably inherited ancestral trappings, when each branch would be taken up by the respective professor during the many hours of the oral part of this academic trial.

Swallow-tail coats of antediluvian cut and threadbare

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porosity were then also worn by professional mourners of professional sanctimonious mien and depressed bearing, crowned with hand-me-down high hats of like ancient vintage. These piety professors of sympathy and sorrow with fitting expression of death-like pallor and waste led the funeral cortèges. They cheeringly waved out into worldly space long widow's weeds of faded shredded crepe suspended from their clownish stove-pipes, all for a reasonable, modest fee. The smallness of the sum was sufficiently distressing to dominate their mournful thoughts and so lend the requisite gloom to this archaic function of the tomb.

Evidently the sober Freiberg academic notions of the eternal fitness of things, recognizing the forlorn tragic kinship of the "exams" and funeral ordeals, prescribed similar historic garb for both—omitting alone at the Academy the crepe, for the time being.

Earlier, en route to the institution, our young couple had passed one of these depressing trains with the lamenting mourner ahead in spirited action. And subsequently in the ceremonial hall the girl, too, had been struck by the resemblance in dress of a candidate for honors and the funeral director on the highway. Should her student ever fail in obtaining his M.E. degree, it was a comforting thought that he could always go into the mourning business for his neighbors' sins and remains, so in any event a professional career would be assured to him.

But to the two happy, care-free American "students" these torturous examination disciplines seemed too much like cruelty to animals—a realistic side of college life of trials and tribulations making anything but pleasant appeal; while to linger over these scenes of nervous tension might only prove to both a bitter reminder of duties neglected. And as such critical reflections threatened to mar the harmonious adjustment of their present charmed existence, they turned away for

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consoling diversion to the great, deep mines of wonders and treasures, in the dark subterranean life of patience and hope.

One of the main shafts, centrally located, was reached after a short pleasant stroll to the suburbs, passing on the way many points of interest to students and their friends in this quaint old city, unique in its history of princes and learned men who here long ago builded the cradle of scientific mining.

The first novelty of the underground excursion was now sprung upon the charming little lady mining candidate. Men's mine clothes were allotted alike to male and female visitors; so she must repair to the dressing room, minus her maid, and there reconstruct and transform herself into a boy miner in real pants, a far more complicated undertaking for her than for the student, who, with the usual man's advantage over the lady in get-readiness, had only to slip on his mine suit as overalls at the mouth of the shaft, where his new mining partner eventually joined him.

Nestled in the bottom of the great bucket, bidding adieu to the life-giving sunlight, they were leisurely lowered down the shaft midst many strange subdued noises from the man-way, the pumps and the man-engine compartments, heard only in mines, to the two-thousand-foot level from which to start the tour of climbing down to even deeper workings. The novel sensation of being so compactly sandwiched in with this choice specimen of young ladyhood in captivatingly boyish attire, as in the dim, shadowy light of their flickering lamps they descended to the lower regions, was ecstatically flustering to the student; and though his somewhat advanced and varied social training in American, French and German student life had left little room for bashfulness, he was nevertheless, at first, too carried away by the magnetism of this particular situation to take notice in detail of his cozy, shapely guest.

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In the brief silence of his mental adaptation to this entrancing physical environment, taking, as it were, an inventory of his suddenly bewitched life, the philosophic student thought it must ever remain among the interesting mysteries of Nature why young girls so often take roguish delight in adopting men's attire while men have no such interest in adopting theirs! And the engineer wondered: could this phenomenon be the germinal proof of woman's admission of male superiority and her ambition to reach the supposedly high level of maledom? Indeed, he wanted to believe—but would not for all the worlds of eternity have her succeed—that she does, in fact, thus pay us the delicate, worshipful compliment of an insatiable desire to become one of our sex, by at least making this imitative effort as far as possible in outward appearance.

While to the engineer the descent was all too short, accustomed as he was to frequent underground trips in the mine-surveying and geological exercises, to the girl it seemed a never-ending drop, down, down toward the center of the earth, notwithstanding she was quite properly preoccupied with some embarrassment, though still much elated at her new mannish attire. Perhaps even the "entangling alliance" with the student in the close quarters of the great ore bucket helped to distract her from the first shocks of a Mephistophelean mining excursion. She had read of love in a cottage, but was this not an even more delicious close-range improvement on that poetic scheme of bliss and air, as these young people were now bound for early encounter with treasures untold?

Miners going down usually hold on to one another against sudden jars which may occur in the travel of the bucket or "skip" from obstructions in the shaft or defects in the guides or hoisting plant—then why should these young folks do otherwise when every natural impulse suggested clinging to the nearest available object,

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animate or inanimate, while the descent was under way! Ever of the progressive party at home, the "young American abroad" was inwardly exclaiming: "What a splendid mining cabin is this now precious ore bucket for highest flights of romantic evolution!" It seemed beyond all human foresight and chivalrous taste, while in this veritable miners' diving-bell, not to start a new chapter of real progress in his compelling *affaire du cœur* with this sweetly inviting American girl—the very choicest exponent of the adorable sugar-plum edible type.

But, riding with her imprisoned and unchaperoned through the dark lonely fastnesses of nature, unraveled by toiling generations of lowly, brawny miners always religious and loyal—for the sole purpose of a lover's refuge as the engineer fancied—would it be fair to shower the lovely girl with caresses, undying in meaning and number, even though she must have been created for this divine purpose for all time? Of course it would not be! Nor could any stretch of conventional drawing-room ethics make this the proper time and place. On further thought, though, he might be sorely lacking in the chivalry of the olden Mining Knights, if the fair lady chanced to be anticipating some entirely new revelation of mining romance to complete the varied surprises of the day; and perhaps she also regretfully recalled some homey comforts of tender parental sympathy that might sustain her in these brave moments of tensioned yet agreeable adventure, so the temperamental girl with mellow, cultured voice of appealingly musical suggestion, might after all tolerate a responsive Freiberg substitute. Anyhow, the young engineer had forever lost a precious opportunity during the entire first thousand feet of travel in the shaft, while the speed of the descending bucket was now increasing; and from surplus religious humility he had missed the chance when mutual emotions were running high in the gallery before the beautiful Madonna; greatest deprivation of all, he

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had behaved well going home in the *droschke,* and with comparative decorum in the train out from Dresden! But thank heavens there yet remained one thousand feet of the antiquated shaft to traverse, while the "spirits of just men made perfect" who had lived and died in its climbing were now crying out for the rejuvenation of the premises—and their memorialization by the new world blessedness of impetuous American youth. And be it said to the credit of the race, miners in particular, that dropping through the second thousand feet in the dismal mine of everlasting night and vast labyrinths of haunted workings, the passengers' only regret was that the student could not reach the bell-rope from the moving skip to signal "go slow" to the powers above.

Thus in seemingly short order they had become of one mind in all things; and it had come to pass that the dear American child, so far from home and mother, was now quite sure that all she had heard in Dresden society about Freibergers must be true; and it had been decisively proven that at least one American mining engineer knew all worth knowing about the universe and just the right thing to do at the right time.

So the delightful young couple alighted safely from the hospitable skip evermore enchanted, in buoyant spirits and supremely happy. Unafraid, they journeyed through the recent ore discoveries and "stopes" adjoining the hundreds of miles of abandoned ancient workings on complex veins in bewildering profusion which had contributed through the centuries their vast treasures to the eternal aspirations and up-building of mankind. And, although these historic galleries, monuments of hope, patience and toil, were inhabited by gnomes and the ghosts of long generations of faithful miners, as told by their descendants, the Americans were too preoccupied with the wonders of earth and of each other to delve further into gripping mysteries.

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To both students the aspirations of foreign education seemed to have found their highest realization, for as startling "talents" they had magically taken the course at the Royal Freiberg Mining Academy in shortest recorded time; and, on massive piles of opulent glistening ore in the shadowy recesses of the immense silver mine of expanding wonders profoundly silent save for the muffled boom and tremor of distant blasts, they had graduated with high honors, and fondly conferred upon each other degrees for proficiency in the great regenerating and sustaining realities of life, eminently satisfactory unto themselves.

When they emerged from their wonderland life in the mysterious metallic world below, of darkness and depth of a thousand graves, it was starlight, but there were also northern lights and rainbows of brilliance and beauty ahead, envisioned through the swelling strains of the chapel organ as the miners' voices rose in the moving hymns of their evening worship.

Evermore grateful to mines and miners, the young Americans abroad, in divine attachment inseparable, dined again together late that night in lovable Dresden.

* * * * * * *

Captivating Freiberg of youth's loving memories, enduringly wrapt in grateful hearts, would that we might meet again as in the years forever past! And now, perhaps, by this time the courageous reader has become half-way convinced that, after all, there may be something in this Freiberg badinage! But if in his estimation this Saxon burg be still not quite the one bright particular garden-spot of all creation, then is it not, in all reason, at least a mining classic of the highest order? But should this, too, be in his doubts, and he also remain unconvinced of the superman powers of mining engineers, after the procession of Immortals proudly

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paraded before him, let him, if he can, turn back the world and his skeptic self to 1875–1880, and in his recovered youth bask in Freiberg's inspiring trinitarian atmosphere of history, romance, and learning, to qualify his verdict, or forever hold his peace in reverential memory of the hour just lived in "perfectly good society."

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